TC 3-21.98

JUNGLE HANDBOOK

AUGUST 2026

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Training Circular
No. 3-21.98

Headquarters
Department of the Army
Washington, DC, 18 August 2026

JUNGLE HANDBOOK

Contents

Page

Preface ..... **xi**
CHAPTER 1 ..... **1**
JUNGLE CHARACTERISTICS **1**
Section I – Jungle Regions **1**
Jungle Types 2
Primary Jungle 2
Secondary Jungle 2
Savanna 3
Section II – Jungle Features **3**
Swamps 3
Bamboo Forests 4
Cultivated Areas 4
Section III – Jungle Terrain **5**
Observation and Fields of Fire 5
Avenues of Approach 6
Key Terrain 7
Obstacles 7
Cover and Concealment 7
Section IV – Jungle Life and its Hazards **8**
Effects of the Climate 8
Flora and Fauna 9
CHAPTER 2 ..... **11**

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FUNDAMENTALS OF JUNGLE OPERATIONS 11
Section I – Understanding Jungle Operations 11
Section II – Factors Effecting Jungle Operations 11
Limited Visibility 12
Limited Movement 12
Slow Movement 12
Noise Dispersion 12
Limited Resupply 12
Limited Intelligence 12
Wide Dispersion of Force 13
Difficult Communications 13
Difficult Command and Control 13
Limited Firepower 13
Section III – Characteristics of Jungle Operations 13
Intelligence 14
Reconnaissance 14
Distinguish Noncombatants From Combatants 15
Section IV – Jungle Clothing and Equipment 15
Weight Carried 16
Equipment 17
CHAPTER 3 27
MOVEMENT 27
Section I – Planning Jungle Movement 27
Factors Affecting Selection of a Jungle Formation 27
Route Selection 27
Jungle Mobility 28
Section II – Formations and Order of Movement 29
Challenges in Jungle Movement 29
Considerations 29
Jungle File 29
Section III – Jungle Land Navigation 31
Night Movement 31
Night Vision Devices 31
CHAPTER 4 33

PATROLS **33**
Section I – Jungle Tactical Considerations **33**
Section II – Routine Squad Jungle Drills **33**
Tactical Halt 34
Short Halt (Breaking Track) 35
Snap Ambush 36
Long Halt 36
Squad Laying Up Point 37
CHAPTER 5 ..... **43**
CONTACT DRILLS **43**
Immediate Action Drill 43
Fire Team Contact Drill Front 44
CHAPTER 6 ..... **51**
WEAPONS EMPLOYMENT **51**
Section I – General Considerations **51**
Section II – Small Arms **52**
Jungle Environment Considerations 52
Small Arms Selection and Employment 52
Additional Considerations 53
Section III – Machine Guns **54**
Advantages of Machine Guns in the Jungle 54
Challenges and Considerations 54
Specific Employment Techniques 55
CHAPTER 7 ..... **57**
DISMOUNTED COMBAT TRACKING **57**
Section I – General **57**
Section II – Types of Tracking **58**
Visual Tracking 58
Scent Tracking 58
Qualities of a Tracker 58
Section III – Elements of Tracking **59**
Element of Tracking 1—Sign 59
Element of Tracking 2—Factors Which Affect Tracking 71
Element of Tracking 3—Judging the Age of Sign 83

Element of Tracking 4—Information Gained from Sign Tracking 92
Section IV – Tracking Techniques and Procedures 99
Tactical Tracking 99
Tracking Reports 104
Section V – Countertracking and Antitracking 105
CHAPTER 8 107
FIRE SUPPORT 107
Section I – Call For Fire 107
Section II – Mortars 107
Advantages of Mortars in the Jungle 107
Jungle-Specific Challenges 108
Employment Considerations 108
Tactics and Techniques 108
Safety and Risk Mitigation 109
Training Emphasis 109
Section III – Artillery 109
Advantages of Artillery in the Jungle 109
Challenges of Artillery in the Jungle 110
Employment Considerations 111
Section IV – Close Air Support 113
Advantages of Close Air Support in the Jungle 113
Jungle-Specific Challenges 113
CHAPTER 9 115
JUNGLE MOBILITY 115
Section I – Planning 115
Classes of Terrain 115
Planning Considerations 116
Section II – Equipment 117
Section III – Dismounted Mobility 120
Section IV – Rope Systems/Installations 134
Section V – Insertion/Extraction Methods 137
Air Assault 137
Fast Rope Insertion 137
Special Purpose Insertion 138

CHAPTER 10 139
RIVERINE OPERATIONS 139
Section I – Use of Boats 139
Use of Waterways 139
Order of Events 139
Selection and Preparation of Boats 140
Movement 143
Actions On 146
Other Considerations 147
Section II – River Crossings 148
Waterway Crossing 148
Hasty Crossing 148
Deliberate Crossing 148
Tactical Methods 148
Alternative Methods 149
CHAPTER 11 151
LOGISTICS 151
Section I – Introduction to Logistics 151
Section II – Resupply Operations 151
Section III – Cache Operations 151
Section IV – Transportation Management 153
Section V – Inventory Management and Warehousing 159
Section VI – Communications and Reporting 160
Section VII – Mortuary Affairs 160
CHAPTER 12 163
COMMUNICATIONS 163
Section I – Introduction 163
Section II – Equipment 163
High-Frequency Radios 164
Very High Frequency Radios 164
Frequency Modulation Radios 164
Mobile User Objective System 164
Satellite Phones 164
Power Sources 164

Accessories 165
Section III – Techniques and Procedures 165
Understanding the Challenges 165
Communication Techniques 165
Alternative Communication Methods 165
Section IV – Antennas 166
Understanding the Challenges 166
Antenna Theory in the Jungle 166
Antenna Types for Jungle Environments 166
Key Considerations for Antenna Selection and Deployment 167
Tips for Optimal Antenna Performance 167
CHAPTER 13 169
FIRST AID 169
Section I – Health and Hygiene in Tropics 169
Personal Protective Measures 169
Hot Weather Injuries 170
Cold Weather Injuries 171
Injuries and Diseases 171
Section II – Casualty Recovery 175
Requesting Medical Evacuation 176
Jungle Penetrator 176
APPENDIX A 179
COMMON WATERBORNE DISEASES 179
APPENDIX B 183
B-720 TIPS (DEC 95), 1/7 SPECIAL FORCES GROUP 183
APPENDIX C 195
TRACKING TERMINOLOGY 195
Glossary 199
References 201
Index 203

Figures

Figure 1-1. Location of jungle regions 1
Figure 2-1. Boots 16
Figure 2-2. Dry bags 19
Figure 2-3. Hygiene pad 20
Figure 2-4. Mosquito net 21
Figure 2-5. Fishing reel 22
Figure 2-6. Belt kit 23
Figure 2-7. Blades 24
Figure 2-8. Hand saw 24
Figure 3-1. Jungle file 30
Figure 4-1. Tactical halt 34
Figure 4-2. Breaking track 36
Figure 4-3. Laying up point 38
Figure 4-4. Occupation of laying up point 40
Figure 5-1. Movement and position of fire team upon initial contact 44
Figure 5-2. Fire team peels right with last man moving right to become lead man in the direction of travel 46
Figure 5-3. Fire team moves through the break point using the “tunnel” 47
Figure 6-1. Tumbling effect of 5.56 millimeter from vegetation 53
Figure 7-1. Sign – regularity 60
Figure 7-2. Sign – disturbance 61
Figure 7-3. Sign – flattening 62
Figure 7-4. Sign – discardables 63
Figure 7-5. Sign – transfer of sand 64
Figure 7-6. Sign – color change (leaf overturn) 65
Figure 7-7. Primary impact point 66
Figure 7-8. Foot roll 67
Figure 7-9. Terminal point 67
Figure 7-10. Dynamics of footprint 68
Figure 7-11. Straddle 69
Figure 7-12. Accelerating into a sprint 70
Figure 7-13. Fast running 70
Figure 7-14. Animal spoor 72
Figure 7-15. Other human spoor 73
Figure 7-16. Grassland “knock down” 74
Figure 7-17. Transfer of the sand 75
Figure 7-18. The dew rubbed off 75
Figure 7-19. Flattening and color change of the grass 76
Figure 7-20. Bruised root 78
Figure 7-21. Crushed dead log 78
Figure 7-22. Over-turned leaf 79
Figure 7-23. Stream bank 80
Figure 7-24. Murky color in disturbed water 81
Figure 7-25. Riverbank downhill 81
Figure 7-26. Sun baked (hard sign) 84
Figure 7-27. Crushed rock (hard sign) 85

Figure 7-28. Disturbed moss (hard sign) 85
Figure 7-29. Discardables from ration pack (hard sign) 86
Figure 7-30. Transfer from the rain on leaf 86
Figure 7-31. Sign after rainfall (soft sign) 87
Figure 7-32. Cracks in bent grass or leaves 88
Figure 7-33. Comparing by breaking a twig 89
Figure 7-34. Comparing with impression with the old sign 90
Figure 7-35. Before and after rain print 91
Figure 7-36. Speed and load of the target 96
Figure 7-37. Tracker team order of march 102
Figure 9-1. Classes of terrain 116
Figure 9-2. Individual equipment 117
Figure 9-3. Mobility specialists 118
Figure 9-4. Squad equipment 118
Figure 9-5. Expendable equipment 119
Figure 9-6. Specialty equipment 119
Figure 9-7. Cordage/tubular nylon anchor for hauling/lowering 120
Figure 9-8. Tie-off with bowline 121
Figure 9-9. Bowline on a bite 122
Figure 9-10. Around the tree (half rope) 123
Figure 9-11. Nepalese braid (half rope) 124
Figure 9-12. Two carabiner sling (half rope) 125
Figure 9-13. Fiddlestick and pull-cord (full rope) 126
Figure 9-14. Carabiner on a figure 8 with pull-cord (full rope) 127
Figure 9-15. Euro death knot (full rope) 128
Figure 9-16. Rappel 128
Figure 9-17. Hasty rappel 129
Figure 9-18. Munter with mule 130
Figure 9-19. Extended rappel with third hand 131
Figure 9-20. Three carabiner improvised device 132
Figure 9-21. Hand over hand 132
Figure 9-22. Ascender 133
Figure 9-23. Tiblock/carabiner 133
Figure 9-24. Haul systems 134
Figure 9-25. Line haul system (Z-pulley) 135
Figure 9-26. Air traffic control from anchor with safety 136
Figure 9-27. Munter hitch 136
Figure 10-1. Amazon River during flood and drought cycle 140
Figure 10-2. Rigid inflatable boat 141
Figure 10-3. Inflatable Combat Raiding Crafts (I-CRC) 142
Figure 10-4. SOC-R 142
Figure 10-5. Indigenous craft 143
Figure 10-6. Boat movement: line of sight 144
Figure 10-7. Boat movement: leap frog 145
Figure 10-8. Boat movement: caterpillar 145
Figure 10-9. Boat movement: packets 146
Figure 11-1. Cache, example 152
Figure 11-2. Platoon drop zone layout, example 155

Figure 11-3. Drop zone marking by day 156
Figure 11-4. Drop zone marking by night 157
Figure 11-5. Drop zone marking, cancelled 158
Figure 11-6. Drop zone marking, temporarily postponed 159
Figure 13-1. Jungle penetrator rescue seat 177

Tables

Table A-1. Common Waterborne Diseases 179

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Preface

TC 3-21.98 provides Soldiers with essential information for operating in tropical jungle environments. It covers topics ranging from jungle terrain and climate to survival techniques, health considerations, and potential enemy tactics. This handbook aims to enhance unit effectiveness and individual survivability when deployed to these challenging and complex operational environments.

The principal audience for TC 3-21.98 is all members operating within a jungle environment. Commanders and staffs of Army headquarters serving as joint task force or multinational headquarters should also refer to applicable joint or multinational doctrine concerning the range of military operations and joint or multinational forces. Trainers and educators throughout the Army will also use this publication.

Commanders, staffs, and subordinates ensure that their decisions and actions comply with applicable United States, international, and in some cases host-nation laws and regulations. Commanders at all levels ensure that their Soldiers operate in accordance with the law of war and the rules of engagement. (See FM 6-27 for legal compliance.)

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The proponent of TC 3-21.98 is the United States Army Maneuver Center of Excellence. The preparing agency is the Directorate of Training and Doctrine United States Army Maneuver Center of Excellence. Send comments and recommendations on DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) to Commander, United States Army Maneuver Center of Excellence and Fort Benning ATZK-TDD (TC 3-21.98) 1 Karker Street, Fort Benning, GA 31905-5410, by email to usarmy.benning.mcoe.mbx.doctrine@army.mil, or submit an electronic DA Form 2028.

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Chapter 1

Jungle Characteristics

The jungle presents a uniquely challenging environment for military operations due to its dense vegetation and complex terrain. This chapter introduces the diverse characteristics of jungles worldwide, including their regional variations and distinct types. This chapter examines key features, terrain complexities, and the plant and animal life found within these ecosystems. Understanding these characteristics is crucial for successful planning and execution of missions in jungle environments.

SECTION I – JUNGLE REGIONS

1-1. Jungles are masses of tropical vegetation that are often tangled, overgrown, and impenetrable. Successful jungle operations require modifications to equipment and tactics, techniques, and procedures (TTP) as the environment can profoundly affect military operations. Primary, secondary, and savanna are the three main types of jungles based on the terrain and vegetation. Primary and secondary jungles can be further classified as tropical or deciduous based upon the predominate trees. Common land features in the jungle are swamps, savannas, and cultivated areas. The large amounts of annual precipitation support incredible plant and wildlife density and diversity as well as making jungles the most ecologically rich and vibrant environments on the planet. They occur most commonly in the tropical areas of the world, mainly Southeast Asia, Africa, and Latin America. (See figure 1-1 for locations of the major jungles.)

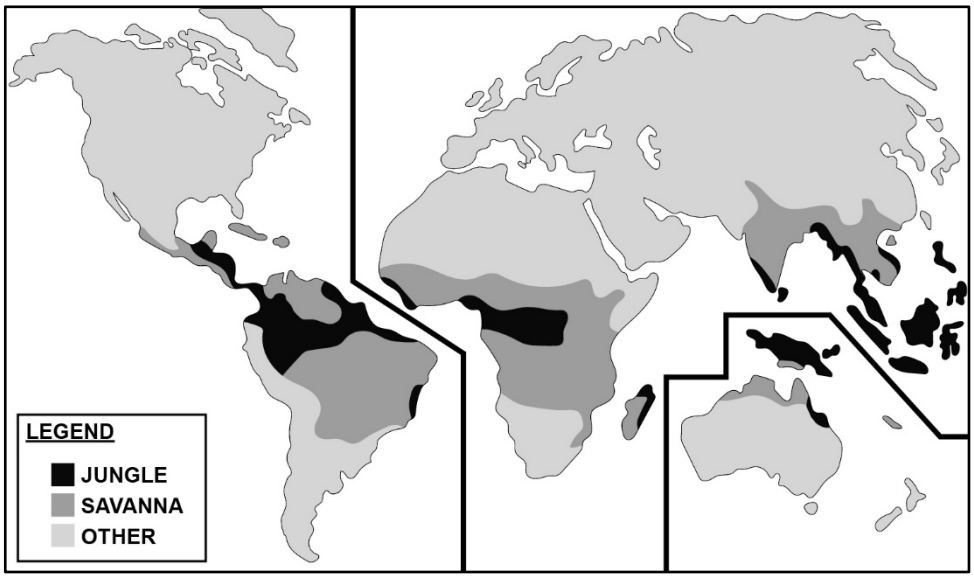


Figure 1-1. Location of jungle regions

JUNGLE TYPES

1-2. Jungles are classified by their vegetation structure and climate. The primary classifications are primary jungle, secondary jungle, and savanna. Primary and secondary jungles can be further categorized by their dominant foliage as either tropical rain forest or deciduous forest.

PRIMARY JUNGLE

1-3. Depending on the type of trees growing in the forests, primary jungles are classified either as tropical rain forests or as deciduous forests. Primary jungles consist largely of old growth trees undisturbed by logging, farming, or other human activities and have tall trees that form a dense canopy. As such, little light penetrates to the jungle floor and undergrowth may be relatively thin. A primary jungle has generally remained untouched by humans and has a thick canopy and clear floor enabling reasonably easy movement and visibility of around 20 meters. The canopy can be three-tiered causing a reduction in light and heat.

TROPICAL RAIN FORESTS

1-4. Tropical rain forests consist mostly of large trees whose branches spread and lock together to form canopies. These canopies, which can exist at two or three different levels, may form as low as 10 meters from the ground. The canopies prevent sunlight from reaching the ground, causing a lack of undergrowth on the jungle floor. Extensive above-ground root systems and hanging vines are common. These conditions, combined with a wet and soggy surface, make vehicular traffic difficult. Foot movement is easier in tropical rain forests than in other types of jungle. Except where felled trees create a gap in the canopy of the rain forest, observation from the air is nearly impossible. Ground observation is generally limited to 50 meters or less.

DECIDUOUS FORESTS

1-5. Deciduous forests are found in subtropical zones where both wet and dry seasons exist. In the wet season, trees are fully leafed; in the dry season, some of the foliage dies. Trees generally grow less densely in deciduous forests than in rain forests. This thinner canopy allows more rain and sunlight to filter to the ground, producing thick undergrowth. The deciduous jungles' thick undergrowth tends to canalize foot movement due to the deliberate efforts required to break new trail. In the wet season with the trees in full leaf, observation both from the air and on the ground is severely limited, the full leaves impact human observation, optics, and detection from aviation assets.

SECONDARY JUNGLE

1-6. Secondary jungles grow predominantly at the edge of tropical rain forests and deciduous forests and in areas where jungles have been cleared and abandoned. Secondary jungles exist in areas that have been previously cleared for farming or logging and are characterized by younger, shorter trees and thicker undergrowth. Secondary jungles appear when the ground has been repeatedly exposed to sunlight. These areas typically display heavy overgrowth with weeds, grasses, thorns, ferns, canes, and shrubs. Foot movement is extremely slow and difficult. Vegetation may reach a height of 6 feet

which severely limits observation. A secondary jungle is generally hotter, especially when direct sunlight is not blocked due to the lack of a canopy.

SAVANNA

1-7. Savannas are natural grasslands, and the few trees present are often grouped together in small groves or thickets. Savannas are generally located away from the equator but within the tropics. Savannas consist of broad, open grasslands with few trees. The thick grass has broad-blades and grows 1- to 5-meters high. Movement in the savanna is generally easier than in other types of jungle areas, especially for vehicles. However, the sharp-edged, dense grass and extreme heat make foot movement a slow and tiring process. Ground visibility varies depending on the height of the savanna grass. Concealment from air observation is poor for both Soldiers and vehicles.

SECTION II – JUNGLE FEATURES

1-8. Common jungle features include swamps, bamboo forests, and cultivated areas. Jungle features are diverse and depend on the specific jungle's location and climate.

SWAMPS

1-9. Swamps are forested wetlands. Common to all low jungle areas, swamps have lots of water and poor drainage. Swamps affect logistical considerations in littoral operations. There are two basic types of swamps—mangrove and palm. Swamps dramatically complicate logistical considerations in military littoral operations by severely degrading mobility, limiting infrastructure development, and demanding specialized equipment and sustainment methods. The unique characteristics of swamp environments force a departure from traditional logistics, requiring a greater emphasis on naval, air, and unconventional supply strategies.

MANGROVE SWAMPS

1-10. Mangrove swamps grow along coastal areas wherever tides influence water flow. The mangrove is a shrub-like tree, which grows 3- to 16-feet high. These trees have tangled root systems, both above and below the water level, which restrict movement to foot or small boats. Observation in mangrove swamps—both on the ground and from the air—is poor. Concealment is excellent. Swamps provide excellent concealment due to a combination of dense vegetation, murky water, and complex terrain. The thick growth of trees, shrubs, and aquatic plants offers visual cover from both air and ground, while the dark, unclear water can hide movement below the surface. The uneven ground, with its mix of land and water, further breaks up silhouettes and provides numerous natural hiding spots.

PALM SWAMPS

1-11. Palm swamps exist in both salt and freshwater areas. Like movement in the mangrove swamps, movement through palm swamps is mostly restricted to foot (sometimes small boats). Vehicular traffic is nearly impossible except after extensive road construction by engineers. Observation and fields of fire are very limited. Concealment from both air and ground observation is excellent. Concealment from both air and ground observation in palm swamps is exceptionally effective due to a unique

combination of a dense, multi-layered canopy and a complex, cluttered understory that obstructs sightlines from virtually every angle.

1-12. The large, broad fronds of palm trees are the primary reason for this. They create a thick, overlapping roof that is extremely difficult to penetrate visually from above, while the dense growth pattern at ground level provides horizontal cover.

BAMBOO FORESTS

1-13. Bamboo grows in clumps of varying heights in jungles throughout the tropics. Large bamboo stands are obstacles for wheeled or tracked vehicles. A bamboo stand is another term for a bamboo grove or a small bamboo forest. It refers to a dense grouping of bamboo plants growing together. Soldier movement on foot through bamboo is slow, exhausting, and noisy. Soldiers should bypass bamboo stands if possible.

CULTIVATED AREAS

1-14. Cultivated areas exist throughout the tropics and range from large, well-planned, and well-managed farms and plantations to small tracts cultivated by individual farmers. Rice paddies, plantations, and small farms make up the three general types of cultivated areas. These areas tend to be open, hot, dirty and swampy, and rubber and palm oil plantations, which offer similar characteristics to primary jungle except for the fact that the trees are in straight lines.

RICE PADDIES

1-15. Rice paddies are flat, flooded fields with muddy and soft bottoms. Farmers control the flooding of the fields with a network of dikes and irrigation ditches and fluctuate flooding with seasonal and agricultural cycles. The variable depth of flood waters directly impacts movement with higher flood waters severely restricting movement. However, travelling by vehicle is difficult even when fields are dry. Concealment is poor in rice paddies. Concealment in rice paddies is exceptionally poor primarily because they are man-made agricultural environments designed for maximum sun exposure and easy access, characteristics that are the opposite of what is required for effective cover. The terrain is flat, open, and lacks the natural complexity and density needed to hide from observation. The combination of low, sparse vegetation and a flat, gridded layout makes any person or object an immediate and obvious anomaly. The cover is limited to the dikes, and then only from ground fire. Observation and fields of fire are excellent. Foot movement is poor when the fields are wet because Soldiers must wade through water and soft mud that is often 20-inches deep. When the fields are dry, foot movement becomes easier. Dikes, about 6- to 10-feet tall, are the only obstacles.

PLANTATIONS

1-16. Plantations are large farms or estates where tree crops, such as rubber and coconut, are grown. They are usually carefully planned and free of undergrowth (like a well-tended park). Movement through plantations is generally easy. Observation along the rows of trees is generally good. Cover and concealment can be found behind the trees, but Soldiers moving down the cultivated rows are exposed.

SMALL FARMS

1-17. Small farms exist throughout the tropics. Farmers often create small farms when they clear the secondary jungle to cultivate crops. These small, cultivated areas are usually hastily planned and after 1 or 2 years are abandoned leaving behind a small open area which slowly returns to secondary jungle. Movement through these areas may be difficult due to fallen trees and scrub brush. Generally, observation and fields of fire have fewer restrictions in cultivated areas than in uncultivated jungles. However, the cultivation removes much of the natural cover and concealment leaving Soldiers more exposed in these areas.

SECTION III – JUNGLE TERRAIN

1-18. Jungle terrain is varied and ranges from nearly flat savanna to impassable mountain ranges. Jungle terrain can canalize operations due to poor cross-country mobility, limited hardened roads and trails, and limited bridges and hardened crossing points. Some areas affect cross-country mobility with poor trafficability due to soft soils, rocky areas, mountains, dense to impenetrable vegetation, marshy areas, streams, and major rivers. Roads are usually scarce, poorly maintained, and primitive. Limited infrastructure reduces hardened crossing points over or through water features. The following paragraphs describe OAKOC. OAKOC is used to conduct terrain analysis. This framework assists leaders evaluate the jungle terrain's impact on operations, informing decisions about movement, maneuver, and logistics.

OBSERVATION AND FIELDS OF FIRE

1-19. Observation and fields of fire are generally restricted in jungles. Steep jungle terrain, extensive and dense vegetation, and intermittent and rapidly changing atmospheric conditions restrict direct-fire weapons well short of their maximum range. The minimum engagement range of weapon systems must be considered when emplaced and employing weapons.

1-20. Even though the landscape appears flat when viewed from above; the terrain under the dense vegetative growth can be undulating with relatively deep streams, riverbeds, and depressions creating significant dead space. Direct fire weapons must be emplaced to provide mutual support and cover dead space. Soldiers cover dead space by utilizing indirect fires paired with sensors, observation posts (OPs), or aerial fire assets.

1-21. When units cannot establish manned OPs from dominant terrain, the only means of observation may be manned aircraft systems, unmanned aircraft systems (UASs), or electronic sensors. However, dense vegetation and weather conditions can severely limit these platforms and systems.

1-22. UASs should be used in conjunction with other unmanned and manned reconnaissance and surveillance systems in a jungle environment. Successful UAS employment in a jungle requires adequate planning for dense vegetation and other environmental factors. Depending on the platform and mission, planners and operators may have to consider the environmental factors in four separate locations: a landing and recovery site, a transit route, a satellite relay site, and an anticipated target location.

1-23. Night vision devices (NVDs) are passive unless paired with an illuminator for active use. Passive NVDs can operate effectively in jungle environments when ambient visible light exists. However, cloud cover, fog, inclement weather, and dense overhead vegetation negatively impact passive NVDs.

1-24. Correction of indirect and aerial fires can be complicated in the jungle environment. Heavy tree cover can cause munitions to detonate in the overhanging branches. Soldiers can overcome this early detonation by using special fusing. Soldiers may also fail to observe the impact of rounds due to limited observation ranges requiring adjustment of fires to be conducted using other methods.

AVENUES OF APPROACH

1-25. Roads and trails crisscross many jungle areas, the majority of which are unimproved and not all-weather capable. Improved all-weather roads that support wheeled vehicles are rare; complex road systems beyond simple commercial links generally do not exist. For centuries, locals have used simple roads and trails to connect centers of commerce, collection points, and natural resources such as mineral deposits and timber resources. Roads and trails in jungle regions support dismounted movement. Speed of movement varies depending on the weather, ground composition, wet gap crossings, and topographical influences.

1-26. The relatively few improved all-weather routes in many jungle areas canalize movement of wheeled and tracked vehicles. Logistics units are heavily impacted by this scarcity and channelization as they require improved routes to maintain the line of communications (LOC) for their large, mission-essential vehicles that have limited off-road trafficability.

1-27. In jungle regions, rivers and streams are primary corridors for moving personnel and material, especially over long distances. These rivers and streams often have heavy overgrowth providing concealment from ground and aerial observation. The threat of fluctuating water levels due to precipitation, or the lack thereof, pose significant danger to Soldiers and their equipment as they traverse rivers and streams. Flooding may occur even when it is not raining in the immediate area. Before crossing rivers or streams, units reconnoiter the far side of the linear obstacle for both trafficability and security. Enemy forces in covered and concealed positions can easily engage exposed Soldiers during gap crossings.

1-28. Normally mangrove and palm swamps prove impassable to all but the lightest equipped forces. Regardless, any force requires detailed reconnaissance to assess trafficability. Many jungles have swamp areas associated with rivers and streams as well as along the seacoast. Old trails or paths may cross the swamp, which are visible from the ground but invisible from the air. Trafficability of swamps directly relates to the depth of the water, which can vary widely based upon precipitation and the time of the year.

1-29. Exploration for and production of oil and other natural resources means wells, pipelines, refineries, quarries, and crushing plants may be of strategic importance in the jungle. Pipelines installed 3 feet (1 meter) off the ground inhibit movement. Subsurface pipelines can also create an obstacle. In Southwest Asia, maps generally indicate locations of subsurface pipelines. These pipes are often buried at such a shallow depth

that heavy vehicles can damage them when traversing them. Furthermore, if a pipeline ruptures, not only is the spill of oil a consideration, but the fumes may be hazardous as well.

1-30. Agriculture in jungle areas typically has large effects on trafficability. The dike systems associated with rice paddies can limit surface mobility and create choke points. Large plantations create areas with great amounts of trafficability for mounted and dismounted forces. Abandoned small farms can create small pockets of secondary jungle which significantly decreases trafficability.

KEY TERRAIN

1-31. Key terrain in the jungle can be any man-made feature, water crossing, water way, or high ground. Because there are few man-made features in the jungle, those that do exist can become important, perhaps even key. Bridges over waterways, regardless of size, often become key terrain due to their relative scarcity. The high ground in the jungle can be key terrain, but limited observation and fields of fire may reduce their importance. In jungle regions, navigable waterways are extremely likely to be key terrain. They often offer the only way to move large amounts of people, supplies, and equipment significant distances relatively rapidly. The meandering routes and variability of water flows complicates their utilization and security.

OBSTACLES

1-32. The jungle is generally a large natural obstacle to wheeled and tracked vehicles as well as dismounted troops. Waterways thick with impenetrable vegetation, steep slopes, swamps, water saturated soils, and mountains all hinder cross-country movement. The few trafficable areas in the jungle are ideal for employing man-made obstacles as the natural terrain denies readily available bypass routes. Buried mines of all types are incredibly effective in jungle regions due to the ability of vegetation to hide any evidence of their emplacement.

1-33. Rivers and streams can pose a danger to moving units, as they can appear unexpectedly, and vehicles and personnel can fall off the elevated embankment. The embankments of a river or stream may have heavy erosion and collapse under the weight of personnel or vehicles. River and stream embankments are particularly difficult to detect when conducting operations using NVDs with limited ambient illumination and thick vegetation.

COVER AND CONCEALMENT

1-34. In jungle terrain, concealment is exceptionally effective due to the dense, multi-layered vegetation that obstructs views from both the air and the ground. The thick upper canopy, formed by interlocking trees and vines, acts as a natural roof, blocking aerial surveillance and diffusing thermal signatures. This same canopy plunges the forest floor into deep shadow, where a chaotic undergrowth of shrubs, fallen trees, and complex root systems provides abundant hiding spots, breaking up silhouettes and masking movement from ground-level observation.

1-35. This natural cover allows soldiers to effectively hide themselves and their equipment, making it difficult for an enemy to detect their presence. The use of natural

foliage for personal camouflage further enhances a soldier's ability to blend into the visually disruptive environment. However, this dense vegetation also presents challenges, as it severely restricts mobility and fields of fire, making it difficult to locate both friendly and enemy forces. The very features that provide excellent concealment also create a claustrophobic and disorienting environment where an enemy could be meters away and remain unseen.

SECTION IV – JUNGLE LIFE AND ITS HAZARDS

1-36. There are four main groups of jungle hazards: effects of the climate, flash floods, deadfall, and flora and fauna. There is very little to fear from the jungle environment. Fear itself can be an enemy. Soldiers must be taught to control their fear of the jungle. Properly prepared Soldiers should have no reason to fear the jungle. The jungle is neutral and affects combatants equally. The combatant whose personnel and equipment are best prepared for jungle operations has a distinct advantage.

EFFECTS OF THE CLIMATE

1-37. The discomforts of tropical climates are often exaggerated, but it is true that the heat is most persistent, and the high humidity can be very uncomfortable. In regions where the air contains a lot of moisture, the effect of the heat may seem worse than the same temperature in a dry climate. Leaders and Soldiers must understand that the jungle environment is neutral; it affects both friendly and enemy soldiers the same. Leaders and Soldiers should reference ATP 2-01.3 when preparing estimates on the effect of terrain and weather on operations. Once acclimatized, most people prefer the regular climate of these areas to the frequent weather changes in colder climates. It is still possible to experience the cold, although of course very low temperatures do not occur. Chilly days and nights are common in hilly areas and in some months a sleeping bag or blanket is required for a good night’s sleep. Temperatures in the jungle may drop 10 degrees (°) or more at night. At minimum, Soldiers should replace wet clothing worn during the day with dry clothing at night. Tropical downpours are usually followed by clear skies and in some areas the rains are predictable at certain times of the day. Except in those areas where rainfall may be continuous during the rainy season, there are few days when the sun does not shine part of the time. Units who operate in the tropics should plan their activities so that they are able to stay under shelter during the rainy and hotter portions of the day.

FLASH FLOODS

1-38. After heavy rain, small streams and dry creeks can rapidly become impassable, and storms further upstream create similar conditions. Never sleep on the bank of a sizeable stream or river.

DEADFALL

1-39. Fatalities occasionally occur from falling trees or branches. In the primary jungle, large trees can be heard falling daily. Always check a laying up point (LUP) site for deadfall, look for leafless trees or those whose trunks have been eaten by termites. Also check for hang ups where dead trees have fallen but are being supported by other healthy

trees. In addition, after periods of prolonged rain, tops of trees can fill with water becoming top heavy. This can bring healthy live trees down without any warning.

FLORA AND FAUNA

1-40. As types of jungle differ around the world's tropical regions, so do the types of flora and fauna. Local knowledge is required by Soldiers to be aware of these differences and any potential hazards.

WORMS

1-41. There are a variety of skin worms that can be picked up in the jungle. Their presence can cause intense itching and red, weeping skin.

INSECTS

1-42. There are various insects that propose a risk to Soldiers operating in the jungle environment to include mosquitoes, wasps, centipedes, spiders, ants, and ticks.

Mosquitoes

1-43. Malaria-carrying mosquitoes are probably the most harmful of the tropical insects and proper precautions must be taken. Mosquitoes are most prevalent early at night and just before dawn. Soldiers must be very cautious especially during these times. Malaria is more common in populated areas than in uninhabited jungle, so Soldiers must also be especially cautious when operating around villages.

Wasps/Hornets/Bees

1-44. Wasps/hornets/bees are common in some places, but these rarely attack unless disturbed. In the event of an attack, the victim should move away to a safe area as soon as possible. Anaphylactic shock is a real danger if an individual is stung badly.

Centipedes/Scorpions

1-45. Centipedes/scorpions can inflict stings which are painful but, in general, are not fatal. These insects like dark and dry places, so it is advisable to shake out blankets before sleeping at night and to clear clothing and shoes.

Spiders/Ants/Ticks

1-46. Spiders are commonly found; their bites are painful but not fatal. Spider bites often require medical treatment due to necrotic tissue and secondary infection. Ants can be a danger and a great annoyance; wounded or incapacitated Soldiers must be kept free from them. Ticks are abundant. They tend to attach themselves to the sweaty areas of the neck, armpits, and crotch.

LEECHES

1-47. Leeches are common in many jungle areas. They are not poisonous, although their bites itch considerably and may become infected if not cared for properly. They release themselves if touched with insect repellent, a moist piece of tobacco, the burning end of

a cigarette, an ember from a fire, or a few drops of alcohol. De-leeching should be a standard practice, in buddy pairs, especially in the evening before washing, if permissible. Trousers should be securely tucked into the boots with mosquito repellent rubbed well into the clothing and boot tops to prevent leeches entering clothing. Leeches are found in swampy areas, streams, and moist jungle country. Soldiers operating in the jungle should watch for leeches on the body and brush them off before they have had time to bite.

SNAKES

1-48. Snakes are generally more frightened of humans than the Soldier is of them, and the Soldier will probably see few if any, and even then, the snake will make every effort to escape. This does not mean that snakes can be ignored, and particular care should be taken when clearing ground. All snake bites should be treated as venomous. If a Soldier should accidentally step on a snake or otherwise disturb a snake, it will probably attempt to bite. The chances of this happening to Soldiers traveling along trails or waterways are remote if Soldiers are alert and careful.

CROCODILES AND CAYMANS

1-49. Although there are few recordings of crocodiles and caymans attacking humans, most of the large rivers in the tropics contain them. Caymans found in Central and South America are not likely to attack unless provoked.

WILD ANIMALS

1-50. The larger mammals are rarely seen. When encountered, they make every attempt to leave the area as quickly as possible. However, all large animals can be dangerous if cornered, wounded, or suddenly startled at close quarters, especially if they are with their young. In the event of an encounter, the formation must withdraw from the area.

THORNY/POISONOUS VEGETATION

1-51. A wide range of plants are supported by defensive mechanisms. These range from thorns, spines and stinging hairs to poisonous saps. The percentage of plants with defenses varies from region to region. For all operations it is advisable to enlist the early help of locals who can advise on what to avoid. On operations some of the dangers can be avoided by applying the correct dress rules.

Chapter 2

Fundamentals of Jungle Operations

Operating effectively in the jungle demands a specific understanding of its unique challenges and requirements. This chapter outlines the core fundamental for consistency governing jungle operations, focusing on the key factors that influence mission success. This chapter explores the characteristics of warfare in this environment, and the importance of specialized clothing and equipment. Mastering these fundamentals is essential for all personnel deploying to a theatre of operation with jungles.

SECTION I – UNDERSTANDING JUNGLE OPERATIONS

2-1. Jungle operations encompass the range of military operations and span the competition continuum, from operations to shape and prevent, to large-scale combat and consolidation of gains. The Army plans and executes jungle operations to either achieve or contribute to national or combatant commander objectives. These objectives may be physical, such as the seizure or retention of key terrain; enemy centric, like the defeat of an opposing force; or population centric, as in humanitarian relief operations. Operations in the jungle may form part of a larger campaign or stand as independent actions. Units conduct operations simultaneously or sequentially along lines of effort. The jungle environment affects the accomplishment of the mission regardless of the type and purpose of the operation. Army leaders conducting jungle operations must consider the following actions when planning jungle operations:

- Understand the jungle environment to determine decisive points.
- Understand how the jungle affects operational and mission variables.
- Retain the ability to converge combat power at decisive points, despite the dispersed nature of jungle operations.
- Continually consolidate gains is essential to retain the initiative.
- Tailor their tactics to the terrain and conditions prevalent in the jungle.

2-2. Operations in jungles tend to be isolated actions by small forces because of the difficulties associated with moving and maintaining contact between units. Divisions can move cross-country slowly, but concentrating forces require aggressive reconnaissance, meticulous intelligence collection, and detailed coordination. More commonly, large forces operate along roads or natural avenues of approach. Patrolling and other surveillance operations are especially important to ensure the security of larger forces in the jungle's restricted and close terrain.

SECTION II – FACTORS EFFECTING JUNGLE OPERATIONS

2-3. Jungle operations are profoundly affected by the dense vegetation and extreme climate, which severely limit visibility, mobility, and communications. The constant heat and humidity degrade physical performance and equipment, while also creating an environment ripe for disease and non-battle injuries. Consequently, successful jungle

warfare relies heavily on small-unit tactics, individual fieldcraft, and robust logistical support to overcome the environmental challenges.

LIMITED VISIBILITY

2-4. The visibility at best will seldom be over 50 meters. Contact with the enemy in such conditions will be at very close range. The limited visibility will allow the enemy to disengage and retreat effectively. Lack of line of sight and clearance may prevent visual contact between units, interlocking fires, and the use of precision guided munitions. It will also condense friendly formations and make sight communication difficult.

LIMITED MOVEMENT

2-5. Roads and tracks are scarce and those that do exist will deteriorate quickly due to jungle growth and tropical conditions. Most movement in the jungle is restricted to movement on foot.

SLOW MOVEMENT

2-6. Difficulties in navigation, heat and rugged terrain limit a section's movement on foot to no more than 5 kilometers (km) per day in good conditions. This is significantly less as the size of the force increases.

NOISE DISPERSION

2-7. Sounds in the jungle do not carry as far as on the conventional battlefield due to the amount of dense jungle foliage. This paired with the limited visibility allows for the enemy to move more freely and remain hidden from friendly force more effectively. The jungle environment presents a unique acoustic challenge. While dense vegetation muffles sound and can limit the distance it travels, movement through that same vegetation creates significant noise that can betray a unit's position. Effective noise discipline is paramount. Although dense vegetation muffles sound, thick undergrowth in certain jungles may make it difficult to conceal movement.

LIMITED RESUPPLY

2-8. Supply routes are restricted to existing roads and rivers. Helicopters are a vital means of resupply; however limited landing areas restrict their use. Soldiers conducting jungle operations must carry extra rations and equipment due to resupply restrictions. Lack of roads and limited helicopter landing zones (LZs) hinder resupply and casualty evacuation (CASEVAC) requiring forces to carry additional supplies and casualties extended distances.

LIMITED INTELLIGENCE

2-9. The intelligence gathering is severely hindered because of the concealment afforded by the jungle. Dominating the ground and the application of patrols is fundamental in gathering intelligence. Intelligence is extremely important to have to better understand the battlefield because limited visibility and noise dispersion allows the enemy to hide very effectively. It is crucial that elements train to have the ability to properly gather, and report information gathered from dismounted patrols, and that this information is disseminated to the force operating within the area.

WIDE DISPERSION OF FORCE

2-10. Soldiers are required to operate over greater distances for long periods to dominate the ground. Soldiers must be capable and commanders comfortable with patrols down to the squad level operating independently.

DIFFICULT COMMUNICATIONS

2-11. The jungle reduces the effectiveness of radios. Frequency modulation (FM) ranges are reduced, and high frequency (HF) communications are affected at night. There is a requirement for rebroadcasting stations if FM is to be viable for command and control above internal platoon level communications. HF communications remain one of the only viable means of communication for long-range radio connections.

DIFFICULT COMMAND AND CONTROL

2-12. Limited visibility, the wide dispersal of force, and limited communications all restrict command and control. Clear and detailed orders are required as command and control rests heavily with junior leaders. Commanders' intent must be disseminated and understood from the lowest level.

LIMITED FIREPOWER

2-13. The jungle restricts the ability to accurately engage the enemy. Direct fire weapons are used at very close ranges and indirect fire weapons are often used with the impact unobserved. Overhead vegetation may block mortars, 40-millimeter (mm) grenades, and hand grenades. Dense vegetation and restricted terrain may limit the effectiveness of grazing or suppressive fire.

SECTION III – CHARACTERISTICS OF JUNGLE OPERATIONS

2-14. Combat in the jungle is characterized by long periods of developing a situation and looking for the enemy, and short periods of violent, and sometimes unexpected, combat. Operations are often dispersed across wide geographic areas and combat power is only massed at decisive points after locating the enemy. Jungle operations are characterized by reduced mobility and limited line of sight, short weapon engagement ranges and response times, multiple and simultaneous engagements from different directions and angles, enemy forces occupying fortified positions.

2-15. Short fields of observation and fire, and thick vegetation make maintaining contact with the enemy difficult. The same factors reduce the effectiveness of indirect fire and make jungle combat primarily a fight between Infantry forces. Support by air and mechanized forces can be decisive at times but is not always available or effective.

2-16. The frequency of ambushes, raids, and meeting engagements makes it very important that small units thoroughly rehearse battle drills. In jungle firefights, the side that initiates contact and gains fire superiority in the first few seconds normally has a decisive advantage.

2-17. Security operations are a critical component of jungle operations. The jungle's dense vegetation, restrictive terrain, and limited LOCs challenge reconnaissance

operations and make it difficult for units to accurately assess the enemy's location, disposition, and intentions. Security operations prevent enemy intelligence, surveillance, and reconnaissance assets from determining friendly locations, strengths, and weaknesses. These operations also provide early warning and continuously disrupt enemy attacks. Active security measures include patrols, OPs, and perimeter security. They reduce the likelihood of a unit being compromised. Active security measures are more effective when used with passive security measures. Camouflage, odor control, trash control, and noise and light discipline prevent enemy and friendly detection. To prevent being tracked by the enemy, Soldiers police trails for trash and avoid locating bivouacs along natural lines of drift.

2-18. To fight and win in the jungle, units must focus on achieving the following:

- Fighting for intelligence (aggressive reconnaissance and surveillance operations).
- Leveraging combined arms (both friendly and local forces) (higher echelon).
- Controlling the essentials (higher echelon).
- Distinguishing noncombatants from combatants (focus on guerrilla forces).

INTELLIGENCE

2-19. A scout familiar with the terrain and the enemy can be an extremely valuable asset. Historically, U.S. Forces conducting jungle operations have utilized host-nation (HN) scouts, attached down to platoon level. These scouts were auxiliaries; paid by the unit they supported from a fund established by higher headquarters (HQ) for that purpose. Local regulations and command policies provide guidance regarding operations security and authorities to utilize HN scouts.

2-20. Generally, radars and photography do not work as effectively because of the concealment afforded by dense foliage. This forces military operations to rely heavily on ground-based reconnaissance and human intelligence to effectively locate and track adversary movements.

RECONNAISSANCE

2-21. Reconnaissance is a mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area. Most offensive operations in the jungle begin with reconnaissance. Locating the enemy is the prerequisite for any successful attack, making reconnaissance patrols the starting point for most offensive actions. The excellent concealment found in the jungle enables the enemy to operate unobserved both by day and night. Extensive patrolling enables Soldiers to obtain information on enemy locations, strength, and disposition.

GROUND RECONNAISSANCE

2-22. Units accomplish ground reconnaissance by means of OPs and long- or short-range patrols. The value of OPs is somewhat reduced in the jungle because of the limited visibility; however, their value as listening posts (LPs) remains relevant for early detection of enemy forces. OPs work best to detect enemy movement when used along trails, roads, and streams. Reconnaissance patrols in the jungle are normally squad sized.

These patrols move in a manner that takes advantage of natural concealment and avoids becoming decisively engaged with the enemy. Aviation assets increase the depth behind enemy lines that units can employ such patrols.

AERIAL RECONNAISSANCE

2-23. Units can use aerial reconnaissance to find remote or partially hidden enemy encampments, helicopter LZs to support operations, as part of military deception operations, or to take advantage of gaps in the jungle canopy. Detailed tactical aerial reconnaissance requires aircraft that can operate at extremely low altitudes and air speeds to penetrate the dense jungle canopy and collect information below.

DISTINGUISH NONCOMBATANTS FROM COMBATANTS

2-24. Despite appearing to be sparsely populated, a variety of indigenous populations—both combatants and noncombatants—inhabit jungles. Recognizing this, commanders rely on the principle of restraint to limit collateral damage and prevent the unnecessary use of force. Commanders exercise discretion with direct and indirect fires, ensuring Soldiers clearly identify and confirm targets as legitimate military targets. Indiscriminate fires into areas assumed to be uninhabited or only inhabited by enemy forces may result in collateral damage that significantly hinders the operation. Commanders make every effort to distinguish between combatants and noncombatants.

2-25. Because jungle combat is primarily conducted by dismounted Infantry, guerrillas, or insurgents, distinguishing between combatants and noncombatants is particularly challenging. Light forces, unencumbered by heavy vehicles, equipment, and supply trains can more easily blend in with noncombatants and hide among the populace. Enemy forces can easily cache light weapons and munitions until needed for operations, enabling them to move freely among the populace and making it more difficult for U.S. forces to identify them. Recognizing that U.S. forces strictly adhere to the law of war, this tactic may embolden enemy forces who feel confident they are safe among the populace.

SECTION IV – JUNGLE CLOTHING AND EQUIPMENT

2-26. In a jungle theater, where roads are scarce and mobility is restricted, all units are required to operate on the lightest possible scales of equipment. This helps to increase mobility and reduce the demand on administrative bases and limited supply routes. Weapons and equipment specially designed for jungle use are not always available; therefore, every item must be critically examined to ensure that it is essential, light enough for manpack, and suitable for use in tropical climate. Due to limited resupply, loads may be heavy and therefore Soldiers must ensure only necessary equipment is taken.

2-27. Clothing/uniform considerations include the following:

- Clothing should fit well (size for top and bottom should be correct).
- The trousers should not be baggy because it creates too much noise and should not be too tight because it causes rubbing and irritation when wet.

- The blouse should be the correct length to cover arms and wrists and pass below the waist and potentially tucked into the trousers based on comfort.
- All buttons are on securely, and there are no rips.
- Items carried in pockets do not protrude or chafe because it could cause irritation or noise.
- Socks do not have holes in them and are high quality (material can be chosen with Soldiers' preference).
- The T-shirt is in good condition and matches the camouflage of the uniform; undershirts can be removed based on commanders' guidance.

2-28. Boots are a very important aspect of patrolling and operating in the jungle and there are a few characteristics that boots must have to work well and provide comfort:

- Boots must have a good source of drainage; these drainage holes can be located on the side of the boot most likely with a metal grommet that helps water seep out.
- Patrol boots must cover above the ankle with a minimum of 6 inches with the ability to tuck the trouser legs into them. Eight inches above the ankle is preferred.
- An additional type of boot Soldiers need is one that they can sleep in and be comfortable with. Characteristics of this boot include those of the patrol boot except the height. Sleeping boots may be mid-length in height (see figure 2-1).

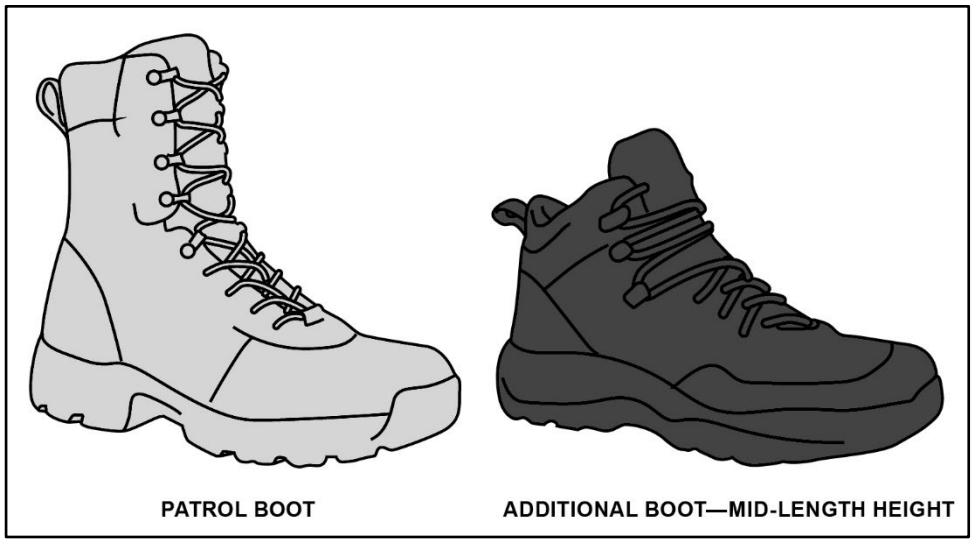


Figure 2-1. Boots

WEIGHT CARRIED

2-29. As the weight carried by Soldiers in the jungle environment increases, their mission performance and effectiveness decreases. Carrying weight of nonmission essential equipment can impair mission performance. The commander tells units how long they can expect to conduct operations without resupply so units can plan the equipment, supplies, and ammunition to carry.

2-30. In the jungle environment, water constitutes a large percentage of a dismounted Soldier's load. Units issue and Soldiers carry additional water sources when conducting operations in the jungle environment. Water sources include bladders or personal hydration systems capable of carrying up to 5 to 10 quarts of water, especially in the dry season. Soldiers also carry water purification equipment and supplies to source potable water, reducing the amount of water that they must carry and the necessity of resupply.

EQUIPMENT

2-31. Many of the challenges presented by the harsh jungle environment can be lessened by altering the equipment used in other standard areas of operation (AOs). For instance, equipment should be lightweight and breathable, utilizing materials that resist the rot and corrosion caused by constant, extreme humidity.

RUCKSACKS

2-32. Because dismounted movement in the jungle often proves arduous and physically demanding, Soldiers configure individual loads, so they drop or hide their rucksacks for recovery later. This allows them to move freely on patrol. Soldiers place some essential items in the rucksack due to the extended nature of operations. They remove those items when the situation dictates. They avoid leaving combat-essential and sensitive items in cached or dropped rucksacks. Unit standard operating procedures dictate the equipment and items individual Soldiers wear or carry, what items they pack in the rucksack, and what items they can cache or leave behind for short duration missions. Units distribute packing lists designed for squads and platoons with careful attention given to balancing loads.

2-33. Small units conducting offensive operations in jungle terrain often need to be self-reliant for extended patrols and long-duration missions. Units routinely plan to operate for 5 to 7 days without resupply carrying what they need in rucksacks. This independence is a form of security; it mitigates the risk that frequent resupply betrays the unit's location. It also enables the unit to conduct the extended patrols required during a movement to contact. Self-reliance also lowers the demand for sustainment/logistics elements and associated infrastructure.

EQUIPMENT CONSIDERATIONS

2-34. There are several considerations that include the following:

- Individual considerations:
  - Maintain personal camouflage.
  - Avoid shiny metal watch bands, wrist Global Positioning Systems (GPSs), or watches. Cover all shiny surfaces.
  - Ensure camouflage clothing is in good repair and effective.
  - Make use of camouflage gloves.
- Personal weapon:
  - Ensure the weapon is camouflaged with the proper paint.
  - Optics can fog over in the humidity.
  - Weapons maintenance is critical. Rust forms quickly in the chamber.
  - Never leave out of one arm's reach.
  - Sling swivels should be removed or taped down to silence.

- Weapon slings, whether the issued item or a length of cord, are essential and must be used.

- Fighting load carrier/tactical assault panels (TAPs):
  - Must be able to carry food and water.
  - When possible, have all equipment secured in basic pouches, avoid the tendency to hang items on the outside of the webbing.
  - Arrange the basic webbing so that it does not interfere with individual movement, especially when crawling.
  - Ensure it is properly camouflaged.
  - Contain a sheet of protective waterproof material like a poncho which can be used in the event the Soldier needs to: keep dry/warm, catch water, or provide a ground cover.
  - The fighting load carrier should never be removed during patrolling activities.
- Body armor:
  - Carried in ruck for longer movements to decrease the chances of heat injury.
  - Prior to a patrol with expected contact, Soldiers remove body armor from ruck and wear.
- Ruck:
  - The item is to be camouflaged.
  - Must be packed in a sequence that makes sense for the mission.
  - Avoid handing equipment off the pack. Everything must be secure.
  - Ensure items are easily accessible.
- Miscellaneous:
  - Never leave any item of equipment not in use unpacked.
  - Waterproof all non-waterproof items of equipment.
  - Carry a spare radio handset and antenna when able.

SLEEPING EQUIPMENT CONSIDERATIONS

2-35. Due to the nature of jungle environments, it is important that whenever possible Soldiers try to limit the amount of time they spend sitting or lying directly on the jungle floor. Jungles are typically very hot, wet, humid, and heavily vegetated. These conditions make the jungle floor a perfect place for microorganisms to live. Extended exposure to foreign microorganisms can cause ill effects and result in rash, sore, and infection. To reduce exposure, personnel should use a ground barrier when occupying a static position, for extended periods of time. When occupying a patrol base use a ground barrier when sleeping, or if the situation allows, consider using a hammock.

- Considerations:
  - Avoid steep sloping ground unless using a hammock.
  - Avoid building under widow makers and potential deadfall.
  - Do not sleep on animal paths or natural lines of drift.
  - Avoid bivouacking near plants that can draw feeding animals.
  - It must be comfortable enough to actually sleep.
  - It must be camouflaged (ground and air).
  - Avoid high ground (silhouette) or low ground (flooding).
  - It must be defendable with escape routes.
- Possible equipment includes the following:

- Poncho shelter.
- Jungle hammock:
  - Enhances survivability.
  - Can be employed tactically (for example, at an LUP).
  - Double-lined hammocks.
  - Hammocks with overhead cover and mosquito protection are preferred for extended stays.
  - Fish net hammocks may be employed quickly to enhance comfort while maintaining a static position (for example, LP/OP need).
  - Inexpensive hammocks are not preferred.
- Ground mat with mosquito bar.
- Poncho liner or jungle bag.
- Mosquito bar.

ADDITIONAL JUNGLE-SPECIFIC EQUIPMENT

2-36. There are a few additional jungle-specific equipment that could be used:

- Dry bags (see figure 2-2):
  - Used to pack clothing or other equipment that needs to dry.
  - Can be used to organize equipment inside of the ruck.

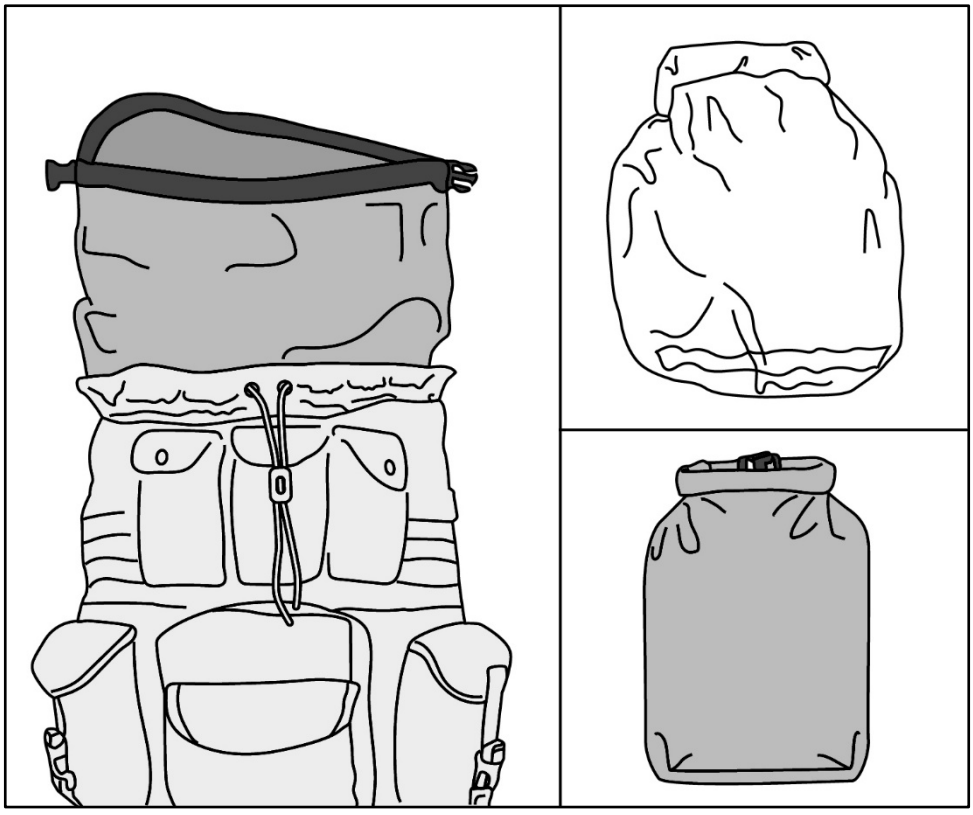


Figure 2-2. Dry bags

- Sealing hard plastic containers and similar waterproof containers:
  - Dry bags are not the only means of waterproof storage in the jungle.
  - To waterproof first aid kits and washed kits, it is highly recommended to use hard plastic containers that feature a strong seal.
  - These containers are easy to camouflage and easy to mark so that they may be found in the dark.
  - Keep in mind that the size of the container must be suitable for the limited space in the ruck.
- Hygiene pad (see figure 2-3):
  - The pad should be small, approximately 24 inches x 16 inches.
  - A best practice for operating in the jungle is to avoid putting bare feet on the ground. Ants, spiders, or scorpions are liable to bite bare feet when conducting hygiene in the dark.
  - To mitigate this risk, carry hygiene pads to put on feet when conducting hygiene.
  - Using a hygiene pad in this manner enables Soldiers to easily powder their feet and put on dry socks without leaving spoor.
  - Never put dry socks on the wet ground.

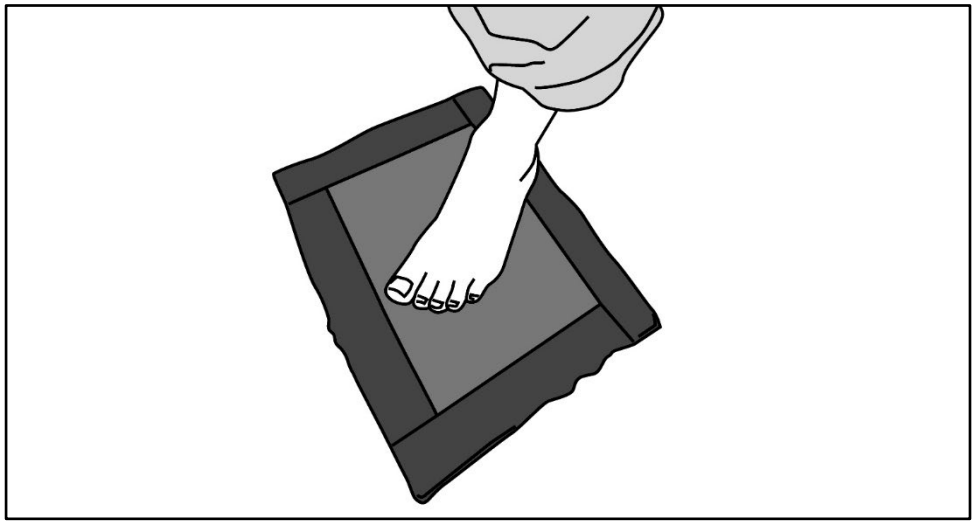


Figure 2-3. Hygiene pad

- Mosquito nets (see figure 2-4):
  - Mosquitos in the jungle are prolific disease carriers. Lessen the chance of contact with mosquitoes by using a mosquito net.
  - The mosquito net may be used when sleeping and when laying prone for an extended period.
  - When donning the mosquito net, put it over the boonie cap.

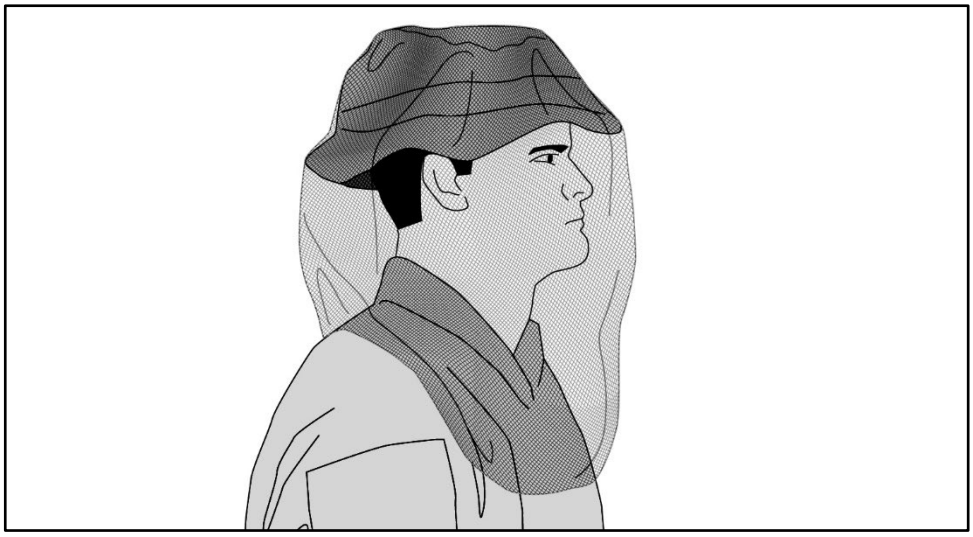


Figure 2-4. Mosquito net

- Fishing reel (see figure 2-5):
  - When operating in the jungle as a platoon, a patrol base is established.
  - Personnel must pull security at designated sentry positions at night, which require moving around in the dark.
  - Laying out a fishing reel with a communications cord (for example, parachute cord) wrapping around the inside perimeter helps guide personnel to their security positions.
  - A separate cord may be routed to the platoon leader and platoon sergeant so that leadership may be easily found at night.
  - It is recommended that all members of the formation carry a fishing reel with a communications cord.

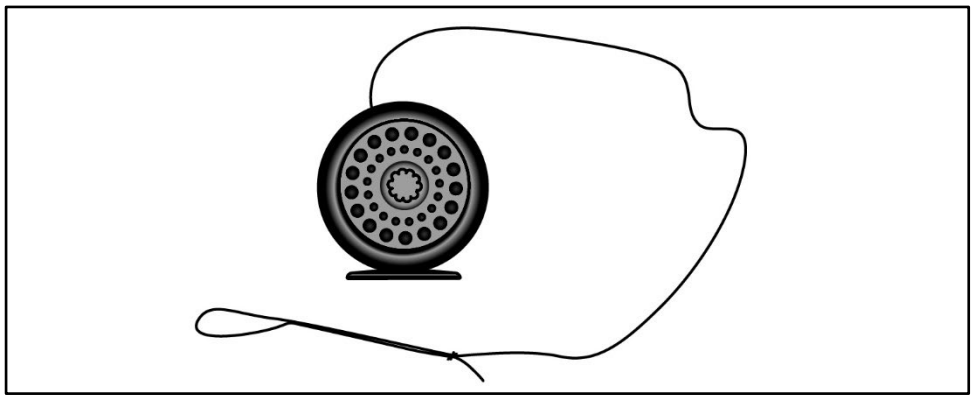


Figure 2-5. Fishing reel

- Belt kit/load carriage (see figure 2-6):
  - A belt kit offers unique advantages over the issued TAPs or fighting load carrier.
  - The belt kit allows stowage of equipment to the rear and sides, which enables Soldiers to maintain a more effective prone fighting position and to crawl without collecting debris that would normally accumulate on the chest rig.

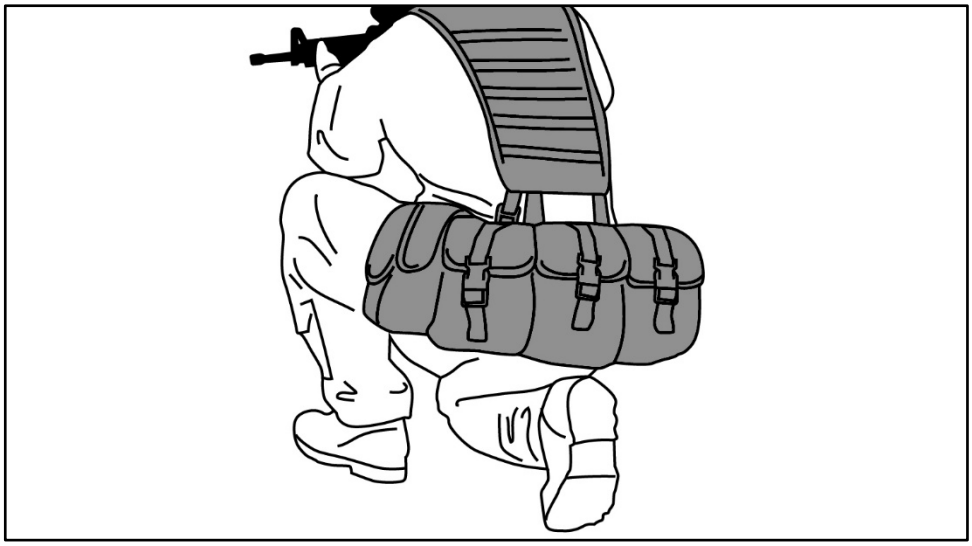


Figure 2-6. Belt kit

- Blades (see figure 2-7 on page 24):
  - Always carry a blade when operating in the jungle. Attach the blade to the body, under the belt kit.
  - Some examples include the parang, kukris, and various types of machetes.
  - Such items should be treated just like a primary weapon. Every time weapons maintenance is conducted, the blade must be cleared of rust and sharpened.
  - Blades serve many purposes, such as clearing vegetation for harbor sites, flora/fauna procurement in survival situations, cutting winch holes for casualties, and as a weapon.

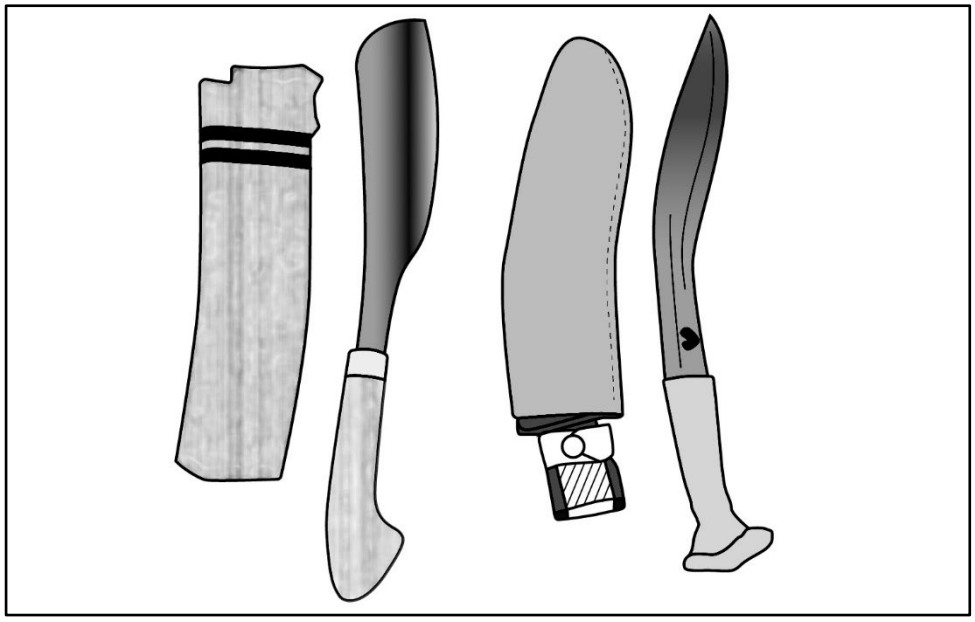


Figure 2-7. Blades

- Hand saw (see figure 2-8):
  - The hand saw in the jungle should be a primary squad issued kit.
  - If it is not an issued item, it is highly recommended that a minimum of two personnel carry a hand saw.
  - Hand saws are useful for building jungle base camps, cutting logs to carry casualties, and to make machine gun positions.

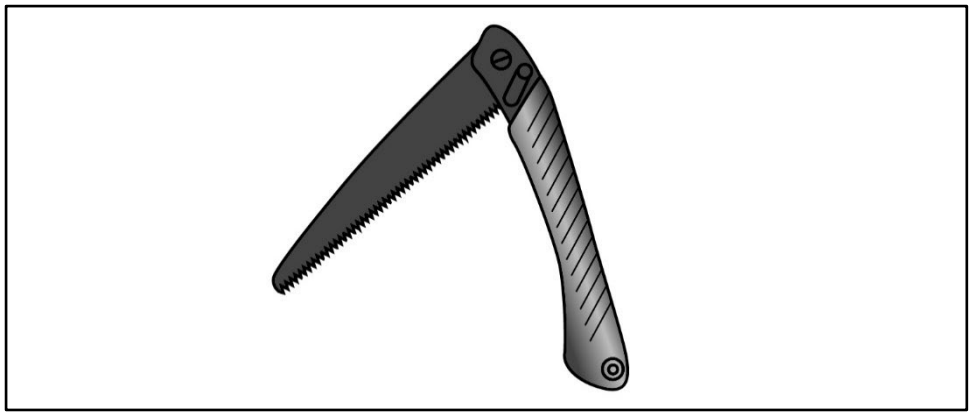


Figure 2-8. Hand saw

EQUIPMENT TRAINING

2-37. Because the jungle environment affects nearly all military equipment, Soldiers train on the proper operation, inspection, and maintenance of mission-essential equipment. Equipment training focused on a jungle environment includes:

- The effects of heat and humidity on equipment.
- Efficient operation of the equipment within the limits imposed by the environment.
- Appropriate preventive maintenance procedures and adjustments to maintenance required by the environment. The appropriate equipment technical manual or lubrication order provides specific information concerning hot climate operations and maintenance.

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Chapter 3

Movement

Successful jungle operations hinge on the ability to move effectively and maintain situational awareness. This chapter details the critical considerations for planning and executing movement in this complex terrain. This chapter covers appropriate formations, tactical procedures, and essential navigation techniques for jungle environments. Mastering these skills is paramount for avoiding detection and achieving objectives.

SECTION I – PLANNING JUNGLE MOVEMENT

3-1. The movement and maneuver warfighting function is the related tasks and systems that move and employ forces to achieve a position of relative advantage over the enemy and other threats. Consequently, the meticulous planning of routes, timing, and mobility is what translates tactical objectives into this physical advantage on the battlefield. In the jungle, planning must de-emphasize speed and instead focus on stealth and detailed micro-navigation, often plotting routes along terrain features like streams or ridgelines rather than established trails.

FACTORS AFFECTING SELECTION OF A JUNGLE FORMATION

3-2. There are many factors unique to jungle environments which require special considerations while operating as a squad. To address these challenges, formations and order of movement must be slightly altered to fit operations in jungle environments. These factors include:

- Limited visibility.
- Limited mobility.
- Slow movement.
- Limited intelligence.
- Logistical (resupply) difficulties.
- Limited communication capabilities.
- Limited fire support.

ROUTE SELECTION

3-3. The jungle environment has a huge impact on the ability of formations to move, because of this there is an importance to do effective route planning prior to any movement. Map reconnaissance is going to have the largest impact on route planning. Higher HQ may give tentative routes or guidance for movement; however, it is imperative that the unit on ground still conducts effective planning taking into consideration the following areas:

- Use observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment [military aspects of terrain] (also called OAKOC).

- Avoid likely enemy contact.
- Speed of movement.
- Tentative halts and sites.
- Countertracking.
- Water sources.
- Time and distance:
  - Solider load.
  - Terrain.
  - Physical conditioning.
  - Illumination.
  - Weather.

3-4. Waterways are the highway of the jungle allowing for the quickest movement as long it can support troop movement. Waterways in the jungle allow less restrictive movement on foot or with the use of watercraft (boat) depending on the viability of the waterway. Jungle amphibious and riverine considerations include the following advantages: vegetation, security, and reconnaissance. The heavy vegetation along the banks of inland waterways offers excellent concealment and enhances the effectiveness of ambushes against watercraft. Unit leaders plan counterambush measures in conjunction with all water movements. Steep, slippery riverbanks coupled with dense vegetation often make committing the waterborne force in a coordinated assault landing extremely difficult. Security measures during the movement phase along a jungle waterway include proper watercraft formations and air observation, when possible. Fire support, to include surface-to-surface, air-to-surface, and naval surface fire must be preplanned for all water movements.

3-5. Leaders plan for waterway reconnaissance. Like route reconnaissance, Soldiers conduct waterway reconnaissance to determine the depth, trafficability, and the impact of the tide on waterways. This information is critical in determining the feasibility of using rivers and other inland bodies of water for movement. Waterway reconnaissance identifies the type and size of watercraft that can operate on the reconnoitered waterway or if on-foot movement is viable. While aerial reconnaissance yields a considerable amount of information, leaders supplement it with reconnaissance by boat, especially in areas where vegetation has overgrown tributaries.

3-6. The unit leader is responsible for the route the patrol takes, but the lead scout selects the immediate path. The lead scout needs to pick the route with care, bearing in mind the other section members' extra weight carriage. The lead scout should avoid steep banks, deadfall and dense vegetation where possible. After selecting a bound, the lead scout should try to memorize it and move forward without looking at the ground. When this is unavoidable, the second Soldier in the order of march should ensure the lead scout's vulnerable arc is covered.

JUNGLE MOBILITY

3-7. Mobility in the jungle is difficult because of challenging terrain with large changes in elevation. Mountain terrain is characterized by high peaks, fast moving rivers, cliffs, steep slopes, deep valleys, and a variety of hazardous obstacles. These features pose unique challenges to military operations. Mountains are defined as land masses rising more than 500 meters around the surrounding plain. They may appear as a single peak,

long ridgelines, or over an entire range. Cliffs and steep terrain are particular hazards which require specialized training. This mountain terrain is commonly found in the jungle. Chapter 9 discusses specific techniques to navigate this terrain however it is important to consider when planning movement in the jungle.

SECTION II – FORMATIONS AND ORDER OF MOVEMENT

3-8. The jungle environment has specific challenges that affect both the unit formations and individual movement that need to be considered when executing movements. Due to the extremely limited visibility and restricted fields of fire, formations must be kept compact, often single-file, to maintain command and control and prevent soldiers from becoming separated. This necessitates a well-rehearsed order of movement, where the lead and rear elements are equipped for immediate action, as contact with the enemy is often sudden and at close quarters. The slow, deliberate pace required for stealth and navigation further dictates that the entire unit must move as one cohesive body, with individual discipline being paramount to the formation's integrity.

CHALLENGES IN JUNGLE MOVEMENT

3-9. Dense foliage and restricted observation put units moving in the jungle at risk of ambush. To mitigate this risk, units use point, flank, and rear security teams to identify and provide early warning of an ambush. These teams must position far enough away from the main body so that if they make contact, the enemy will not engage the whole force. However, they should not be so far away that they cannot provide mutual support. These security teams must stay alert to the signs of the enemy and should carry as light a load as possible so they can maneuver quickly and easily. The main body and the security teams maintain contact to prevent fratricide.

CONSIDERATIONS

3-10. The two most used formations in jungle environments are the file formation and staggered column formation. The distance from the lead scout team to the rest of the squad is 10 meters or METT-TC (I) (mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations) dependent. Distance between personnel for the rest of the squad is 3 to 5 meters or METT-TC (I) dependent. The distance between each element should be 5 to 10 meters or METT-TC (I) dependent.

JUNGLE FILE

3-11. The most advantageous movement formation for units in the jungle is the file. This formation allows the unit to stay small and allows for quicker movement in the dense foliage and helps the unit leader maintain the best command and control of the formation (see figure 3-1 on page 30).

3-12. Advantages include the following:

- Hand signals are easily passed and acknowledged.
- Movements are simple and Soldiers follow the same path of travel.
- On contact, the enemy are not easily able to estimate the strength of the patrol.
- Movement is quiet and the formation may still be used at night.

- Maximum security is oriented towards the flanks; this is important for reacting to ambushes in the jungle, which are common and deadly.
- Single file forms the basis for immediate action drills (IADs).
- Decreases the change of visual detection.
- Disturbs the minimum amount of vegetation.
- Reduces the noise.
- Single file enables the leaders to maintain control.
- An extended line is normally used in the assault or when conducting a sweep through an ambush or contact area.

3-13. Disadvantages include the following:

- Cannot produce immediate and effective frontal fire.
- Vulnerable to defilade fires.
- The track sign left behind by the formation is obvious for many days.
- The patrol has no depth and may be easily ambushed.
- Little lateral coverage of the ground.

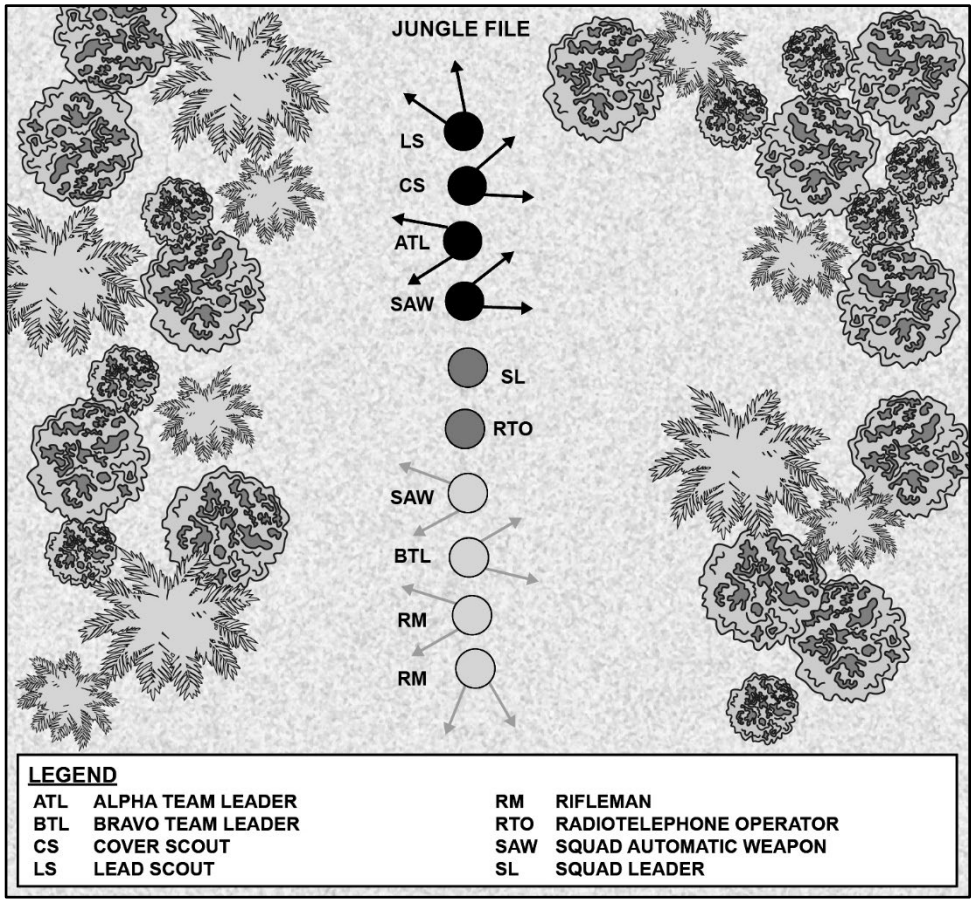


Figure 3-1. Jungle file

SECTION III – JUNGLE LAND NAVIGATION

3-14. Navigation in the jungle environment has specific consideration. At night, this challenge is magnified exponentially, as the profound darkness renders landmarks invisible and can disorient even experienced Soldiers, forcing teams to use methods like illuminated compasses and pace counting with extreme care to avoid giving away their position.

NIGHT MOVEMENT

3-15. The principles for movement at night in the jungle are the same as those for movement by day. The main problem is with visibility and the effects that limited visibility has on command and control. With favorable moon and canopy conditions, movement can be conducted at a slow and deliberate rate, allowing surprise to be achieved and giving the use the tactical advantage. In adverse light and weather conditions, movement is inevitably slower and difficult to control; unless a strong tactical requirement is evident, it will probably not be worthwhile.

3-16. Improvements to night vision, navigation, and communications technologies, coupled with well-trained Soldiers, enable jungle operations during limited visibility. Historically, forces conducted jungle operations mostly during daylight because of technological limitations, navigational challenges, and fatigue.

NIGHT VISION DEVICES

3-17. If used correctly, night vision equipment can help significantly with the ease and security of a night move. The following paragraphs 3-18 to 3-20 explain how to select and prepare NVDs for operations.

3-18. Depending on the type of NVD, they require ambient light to work effectively; thick jungle canopy or an over-cast moon causes them to perform poorly. More advanced NVDs can provide an infrared flashlight to improve image quality when no ambient light is present. However, the enemy can spot this infrared light easily if they also have night vision goggles. Detailed planning for the use of these aids and their ancillaries needs to be conducted if friendly forces are to get the most utility from them. Most goggles and monoculars come with a helmet mount and a head strap for use without a helmet. It is, however, quite standard for Soldiers experienced in temperate environments to only be issued the helmet mount. This is clearly a limiting factor as no Soldier wishes to conduct extended periods of movement in the jungle, even at night, with their helmet on. The additional sweat produced and the humidity that the helmet traps around the head causes concerns over increasing the risk of heat casualties and causes the device to mist up. Using the device without a mount or strap by placing it in a convenient pocket and taking it out for use only when required is also an option. In this situation it should be noted that the humidity that the body creates likely causes the device to steam up in a pocket, thereby rendering it useless when taken out for use. Although the head strap is additional weight, it may be the best solution to allowing goggles and monoculars to be worn for a prolonged period during a night move.

3-19. The humidity at night in the jungle is very noticeable, especially at dawn and dusk. This humidity becomes the natural enemy of the NVD, misting it and therefore rendering

it unusable. There are several de-misting fluids and cloths that can be used to help reduce this issue, but extra care must be taken not to breathe directly onto the device or place it close to the body for extended periods; both of which cause misting. Some NVDs come with a sacrificial lens over the top of the actual eye piece. This stops damaging the expensive and it is difficult to replace the lens itself. The sacrificial lens, however, acts as a trap for moisture, making it difficult for a device to be de-misted. These sacrificial lenses can often be removed to help improve the de-misting. However, this needs to be a taken at risk by the chain of command as the chances of NVDs becoming unserviceable with scratched lenses increase significantly and therefore reduces the unit's overall night vision capability.

3-20. Thermal imaging equipment produces a picture by displaying the temperature difference between the elements of what is being observed. The system does this using a black and white scale, where one color represents hot items, and the other color represents cold items. Thermal imaging, however, cannot see through the undergrowth and therefore still requires a clear field of view to see an enemy. Tall grass, a thick patch of trees, and many low-level leaves and branches will therefore obstruct the line of sight and prevent Soldiers seeing the enemy. Thermal imaging is also limited in its definition of the surroundings, with all leaves gaining and losing temperate at roughly the same rate and all appear as a single block of color when viewed on thermal imaging.

Chapter 4

Patrols

The jungle enables an enemy to live, train, and operate in reasonable safety, blend with the local population from which they probably come and to use his superior knowledge of the ground to attack. Aggressive patrolling is the first counter to this, which leads to the launching of operations at battalion level or higher to destroy their fortified camps or villages. Chapter 4 explains patrols in the jungle environment. Patrol doctrine for the jungle environment mirrors information outlined in TC 3-21.76 with a slight modification to address the impact of the jungle environment.

SECTION I – JUNGLE TACTICAL CONSIDERATIONS

4-1. There are a variety of considerations that are unique to fighting in a jungle environment. Some of these include—

- Dense vegetation and limited visibility.
- Intense terrain changes over short distances.
- Resupply difficulties.
- Degraded communications capabilities.

4-2. Some of these factors necessitate the use of smaller elements to create the desired impact against the enemy. This drives a demand for squad-sized operations. Due to the importance of small unit patrols and the considerations, it is vital that the squad is trained and equipped to fight violently and aggressively in the jungle. These factors require the use of dispersion or smaller elements when conducting operations within the close country tropical environment (CCTE). Elements working as part of a larger echelon need to have the ability to move independently, fight violently and aggressively, sustain themselves, communicate intelligence, and culminate on a larger objective. Smaller squad-sized elements also drive screening or reconnaissance missions to enable objectives.

SECTION II – ROUTINE SQUAD JUNGLE DRILLS

4-3. Routine drills, also commonly referred to as formations and order of movement (also called FOOM), in the jungle are like those executed in other environments and follow the same principles. However, they are altered due to some jungle specific considerations, including: the threat and effectiveness of combat trackers, extremely limited visibility, and intense terrain. All routine drills must be conducted in the same sequence. This is to ensure proper employment of security, and execution of the drills by every member without talking to maintain noise discipline.

4-4. Temporary halts place units at risk of discovery and attack. Units plan halts on terrain that lends itself to a perimeter defense or good concealment. During short halts, Soldiers find cover, drop to one knee, and face outward with their weapon at the ready.

If the halt occurs at a trail crossing, leaders send security teams out along the trail. The security team remains in place until the unit clears the crossing. During longer halts, units establish a perimeter defense. They establish LPs and OPs around their positions and employ claymore mines and early warning devices.

TACTICAL HALT

4-5. The tactical halt, sometimes referred to as a tactical pause by partnered jungle forces, is the most frequently used routine drill and should only be employed for a maximum of 10 minutes at a time before moving off or taking up a more appropriate defensive position. The tactical halt is used to listen for enemy activity, to check the compass or map, or to conduct a necessary priority of work. It is not necessary to break track to conduct a tactical halt; the squad should simply step off the track and cover all arcs in a herringbone formation. This provides concealment from anyone looking up or down the track or following the squad's direction of travel and gives leaders the ability to move up and down the formation. While the formation is conducting a tactical halt, Soldiers take a knee and do not remove any equipment, as well as checking overheard for any deadfall or hazards (see figure 4-1).

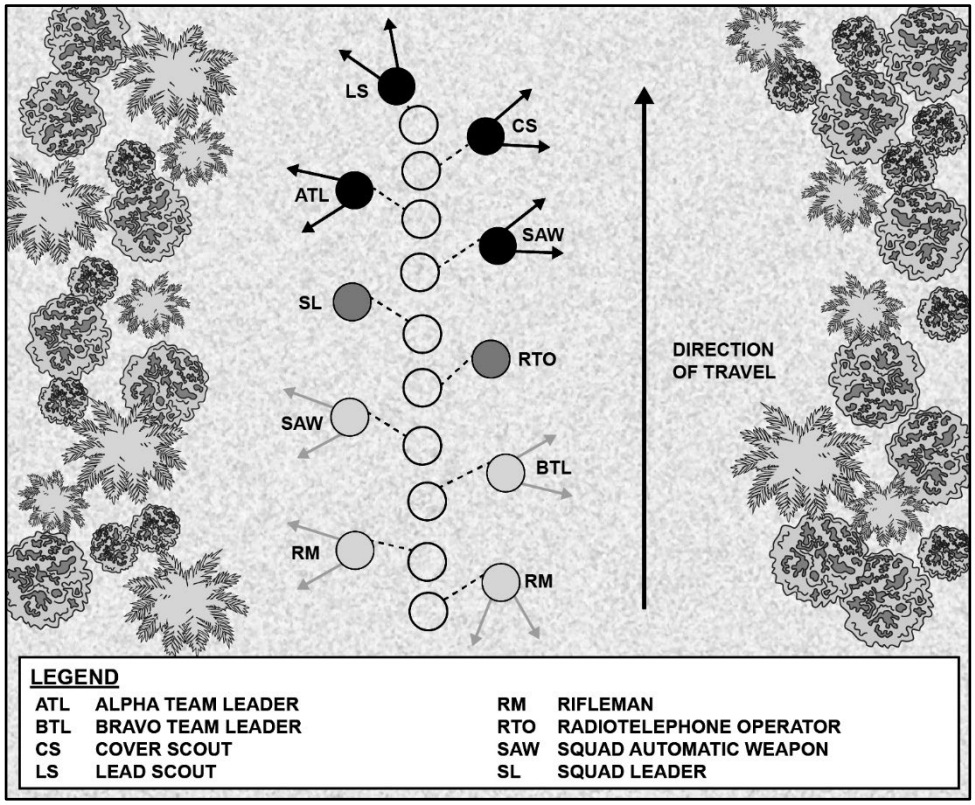


Figure 4-1. Tactical halt

SHORT HALT (BREAKING TRACK)

4-6. A short halt is a deliberate break in movement and should not exceed 30 minutes. This time is used to conduct essential tasks before resuming movement, such as water resupply, administrative duties, and communications checks. During the halt, rations may be consumed while maintaining 50 percent security, and a reconnaissance team is dispatched to the tentative long-halt position.

4-7. Once the section commander has decided on the general area of the short halt they must inform the patrol. The lead scout, having received the hand signal, breaks track at 90° to the line of march (button hook). The section moves into a break track position observing the original line of march. The distance between the original line of march and ambush is not specific, but it must be far enough away to be concealed and out of immediate sound yet still able to maintain general awareness of the track. When breaking track for a short halt, the squad is further away from the track than if breaking track for a snap ambush (see figure 4-2 on page 36). The following is accomplished:

- Once the squad leader (SL) has decided on the general area, the patrol conducts the long halt and they must inform the patrol.
- The SL, having received the appropriate hand signal, breaks track at 90° to the line of march (button hook).
- The squad then moves into a short halt position while observing the original line of march:
  - The last Soldier to break track covers the sign left behind at the entry point.
  - This is to slow down any possible enemy tracking.
- There is no specified distance between the patrol track and the short halt; however, it must be far enough to provide effective concealment.
- The squad remains in position, listening and observing the original line of march.
- Rucks may be covered at the patrol commander's discretion using the 50/50 buddy team method.
- One person (commonly the radiotelephone operator) should cover the rear sector of fire.
- Once the SL is satisfied that there is no immediate follow-up to the patrol, they signal "SLLS complete" (stop, look, listen, smell).
- This technique can also be utilized if there is an immediate threat of enemy ambush.
- Squad members conduct any necessary admin during the short halt, and once again conduct SLLS before moving off.
- The squad moves off the short halt back to the main track using an alternate route to the track and continues the patrol.

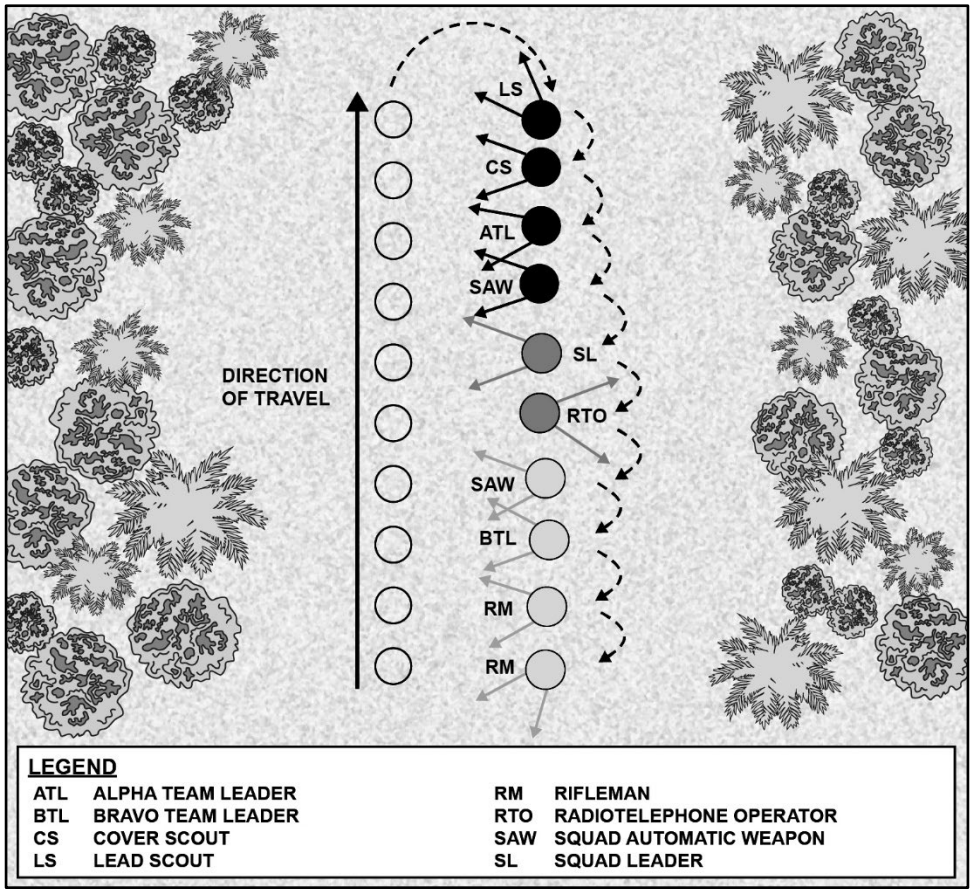


Figure 4-2. Breaking track

SNAP AMBUSH

4-8. This is used if the squad believes there is an imminent threat of follow-up. The squad conducts a break track in the same manner as the short halt; however, they remain closer to the track to have better observation as the entire squad will be at stand-to until the SL determines there is no immediate threat. The section remains in the ambush position listening and observing the original line of march. Rucks may be removed at the commander's discretion. One Soldier should cover the rear arc of the section. Once the commander is satisfied that there is no immediate threat, the squad can continue with their patrol.

LONG HALT

4-9. A long halt is a planned pause that should not exceed two hours. This time is used to conduct priorities of work, resupply, administrative duties to include planning for follow-on missions, communications checks, and reconnaissance. During the long halt,

priorities of work are conducted while maintaining 50 percent security and a reconnaissance team is dispatched to the tentative LUP location.

CHARACTERISTICS OF A LONG HALT

4-10. Characteristics of a long halt include the following:

- Easily defendable for a short period of time.
- Away from natural lines of drift (for example, paths of least resistance likely to be followed during travel).
- Away from high-speed avenues of approach (for example, roads, highways, rivers, and streams).
- Provides aerial and ground cover and concealment.
- Provides little to no tactical value to the enemy (for example, not on high ground or key terrain).

PRIORITIES OF WORK

4-11. Priorities of work are as follows:

- Security.
- Weapons maintenance.
- Hygiene.
- Chow. (Hygiene and chow may be interchangeable at the discretion of the SL.)

SQUAD LAYING UP POINT

4-12. An LUP is a covert location in which a squad can plan and rest for the next day's patrol or mission. An LUP shares similar characteristics with a patrol base but serves a different purpose. An LUP is not designed for defense but to stay covert and avoid compromising personnel and the mission. Priorities of work in an LUP should be minimized to the essentials and each LUP site should only be used for a single night (see figure 4-3 on page 38).

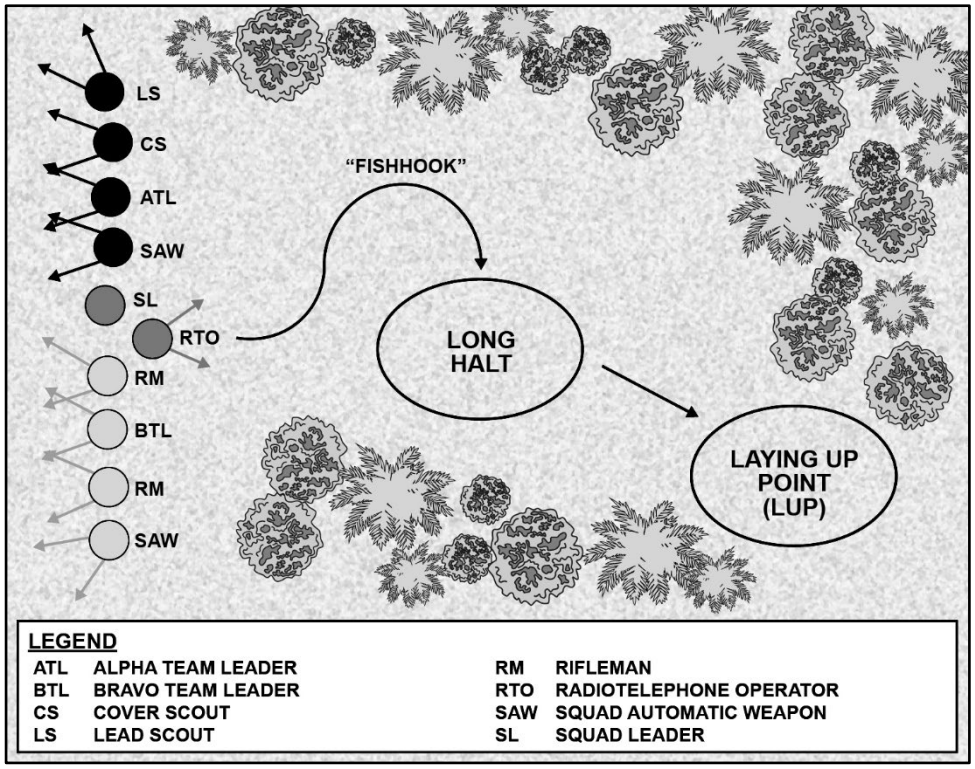


Figure 4-3. Laying up point

4-13. Characteristics of an LUP include the following:

- Easily defendable for a short period of time.
- Away from natural lines of drift (for example, paths of least resistance likely to be followed during travel).
- Away from high-speed avenues of approach (for example, roads, highways, rivers, and streams).
- Provides aerial and ground cover and concealment.
- Provides little to no tactical value to the enemy (for example, not on high ground or key terrain).
- Located near a water source. A decentralized, squad-level patrol is unlikely to receive resupply. Therefore, occupying near water may prolong the longevity of a patrol. However, be aware that enemy or civilian camp sites will likely also be near water. In the jungle, flash flooding may occur almost instantaneously. Pay attention to weather conditions if occupying near water.
- Have multiple escape routes. An LUP should support the execution of an effective black and gold plan in case of compromise.
- Free of hazards such as built-up deadfall.

4-14. When setting up an LUP the unit should take into consideration the formation and the spacing. For the formation of the LUP, it appears as a vague circle of resting

positions or hammocks. The LUP is not a defensive position. However, if the site exhibits the characteristics listed previously and routine drills are deliberately followed, the risk of compromise or enemy contact is minimized. During occupation, avoid cutting saplings and minimizing the amount of spoor left behind. Avoid using light at any time regardless of the color. The unit leader should exercise control over the spacing between members of each element. Keep members near one another to facilitate effective command and control. Squad members should be paired but not placed directly next to each other (maintain a spacing of 3 to 5 meters between each person). The diameter of the LUP is restricted by the terrain but should enable the SL to maintain command and control. The LUP has no established defensive perimeter; therefore, there is risk of fratricide and intrusion by wildlife when squad members move around. A slit trench should be created inside the LUP to keep all friendlies inside the LUP boundaries. Squad members must recognize the importance of staying within the LUP. Moving outside the established perimeter is prohibited and increases the risk of fratricide.

OCCUPYING AND ESTABLISHING A LAYING UP POINT

4-15. The following information explains the steps that are required to utilize an LUP. The occupation and establishment of an LUP is a tactical procedure in which a patrol moves into a pre-selected or opportunistically chosen location to remain undetected for a period, allowing Soldiers to rest and continue planning (if not completed in the long halt). The following are the typical steps required to utilize an LUP.

Note. If planning in an LUP, all essential personnel must plan under no less than a double layer poncho or tarp.

SITE SELECTION

4-16. The following information is used to select a proper site for the LUP:

- Prior to last light, the squad carries out the routine short halt (tactical pause) and long halt drills.
- Once the squad occupies the long halt, it sends out a four-member reconnaissance team to identify a suitable LUP site.
- The reconnaissance team must ensure that the site exhibits the desired characteristics, viable sentry positions exist nearby, and is large enough to accommodate the squad.

OCCUPATION

4-17. The following are procedures in occupying an LUP:

- Once the reconnaissance team reaches the tentative LUP site, SLLS is conducted at its 6 o'clock position.
- Once SLLS is complete, the SL emplaces the S/O (surveillance and observation) team consisting of the alpha team leader and one rifleman (RM) at the 6 o'clock position.
- The SL and the radiotelephone operator begin to clear the site:
  - They clear from the 6 to 3 o'clock, 3 to 9 o'clock, 9 to 12 o'clock, and finally from the 12 to 6 o'clock position.
  - SLLS is conducted at each position.

  - The SL ensures that the site meets the desired LUP characteristics and is free of deadfall.
  - The SL also tentatively identifies trees for squad members hammocks.
- Once the site has been fully cleared, the SL gives the S/O team a five-point contingency plan (GOTWA) and receive a backbrief.
- The SL gives the far recognition signal to the rear element to avoid fratricide.
- After receiving the far recognition signal, the rear element prepares for movement by covering spoor and putting on rucks 50/50.
- As the SL approaches the rear element, the SL gives the near recognition signal. The SL positions themselves back in the regular order of movement, while the RM from the reconnaissance team leads the squad to the LUP site to avoid leaving more ground sign.
- As the squad enters the LUP site, they establish a kneeling 360-degree security posture with 50/50 rucks off. The squad then conduct SLLS.
- The squad remains at stand-to until complete darkness and the SL decides to stand down for the evening. Squad members should be located directly next to the tree that they plan on using for their hammock and identify visually the route to the other tree for their hammock (see figure 4-4).

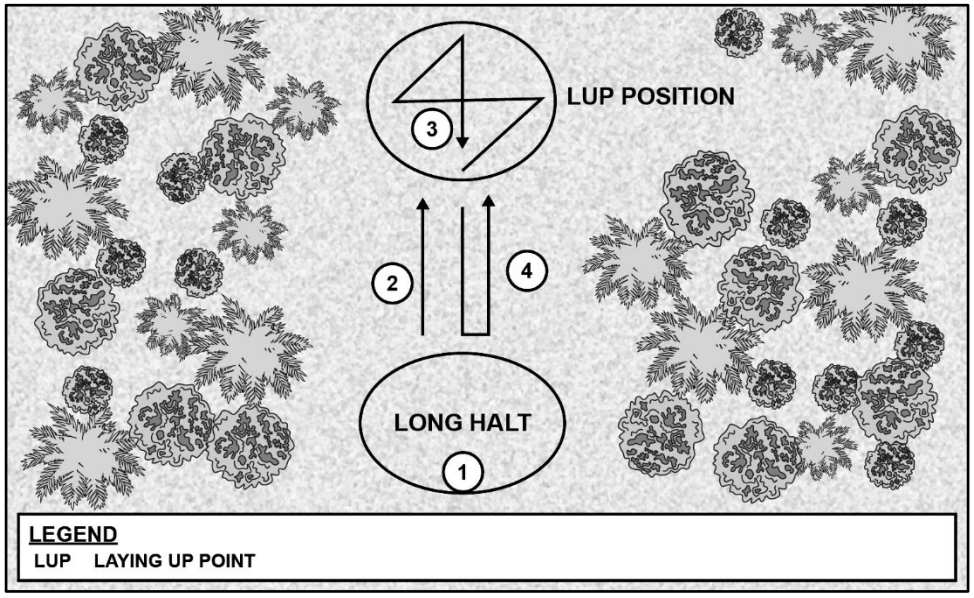


Figure 4-4. Occupation of laying up point

LISTENING POST/OBSERVATION POST

4-18. LP/OPs are a critical portion of a standard LUP:

- LP/OPs may be emplaced if necessary. However, effective site selection and adherence to LUP procedures reduce their need.
- The LP/OP consists of two squad members located just outside of the LUP facing the patrol route followed to the LUP site.
- Claymores should be emplaced alongside an LP/OP.

OTHER CONSIDERATIONS

4-19. The following are not requirements but are other important aspects of an LUP:

- During the occupation, the element should identify the trees they will use to set up their hammock or poncho so that the procedure may be completed quickly and quietly after stand-to is complete.
- Claymore mines may be emplaced beyond the LUP perimeter if applicable to the escape plan and there is greater possibility of enemy contact (see figure 4-4 continued).

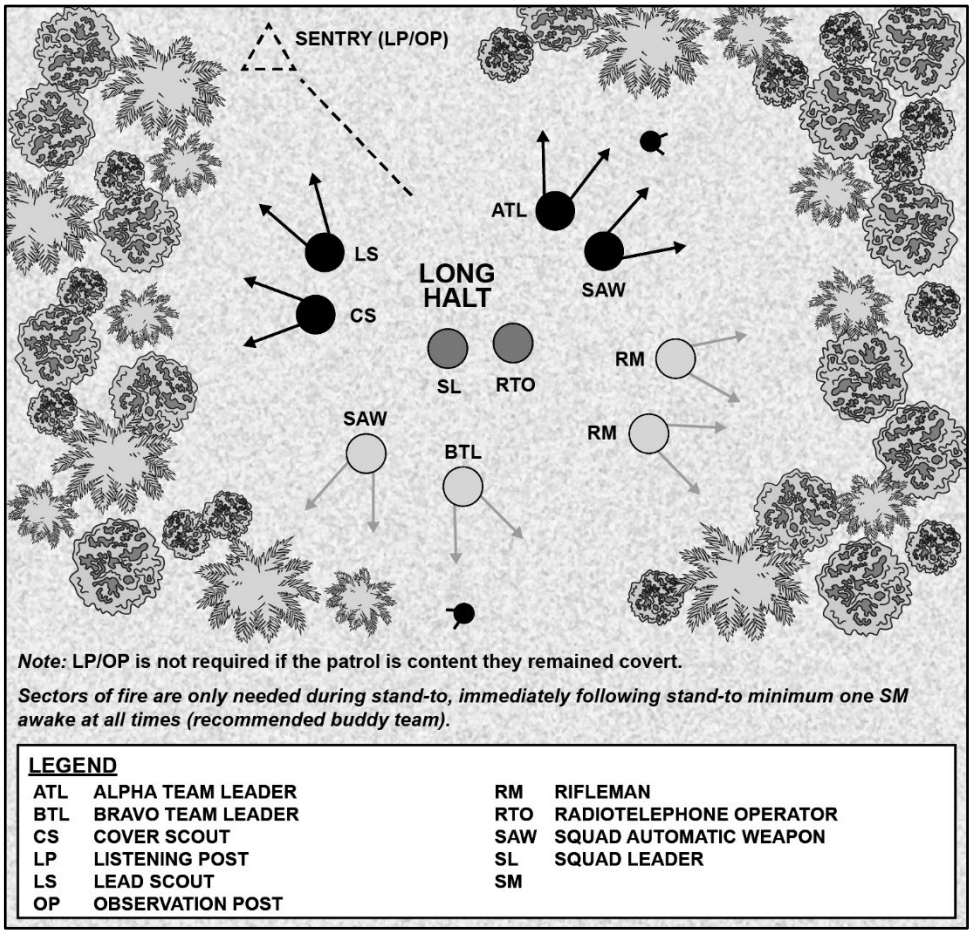


Figure 4-4. Occupation of laying up point (continued)

Laying Up Point Key Tasks

4-20. There are a variety of key tasks that can be completed in an LUP. While in an LUP, a patrol conducts remaining essential tasks, and rest to restore operational readiness. The patrol will focus only on LUP-specific hygiene, security, and rest/recovery.

Hygiene

4-21. Personnel will set up ponchos or hammocks in positions designated by the SL.

4-22. A wet/dry kit drill is conducted for sleep. The dry kit, worn while sleeping, is a completely dry uniform with a dry pair of boots. All personnel powder their feet, preferably inside their hammocks, to help the body dry out through the night and prevent infections or chafing. Map, compass, and other essential gear are transferred to the dry uniform. The wet kit is placed into rucks. Rucks are packed up and placed within arm's reach from individual resting positions. The fighting load carrier or TAP is placed on top of the ruck. Individual weapon is placed within arm's reach from the resting position, either on top of the ruck or otherwise.

Security

4-23. The SL disseminates essential information and contingency plans, including current grid location, rest schedule, wake up criteria, stand-to procedures, escape routes (black and gold plan), engagement criteria, emplacement of claymore or sentries, and any other pertinent information.

4-24. The patrol keeps at least one person always awake. Since the LUP is a covert position, not a defensive position, it is preferable to reduce the number of personnel moving around at night. Fewer awake personnel generate less noise from movement.

4-25. If operating in buddy team pairs, one member pre-sets their compass to the “black” azimuth and the other to the “gold” azimuth. This ensures rapid execution of the escape plan if the patrol is compromised.

4-26. The patrol leader must weigh the need for security against the need for stealth when using NVDs. These devices produce a distinct sound when turned on; frequently turning them on and off may give away one’s position when conducting night security.

Rest/Recovery Plan

4-27. Once stood down for the night, personnel sleep until the time prior to stand-to issued by the SL.

4-28. Once awake, the squad members conduct the morning routine. The morning routine should be a reverse of the night routine: personnel swap back into their wet kit, pack up all equipment and hammocks or ponchos, and be fully combat ready prior to stand-to.

Chapter 5

Contact Drills

Contact drills are modified battle drills that enable teams and squads to react swiftly and effectively to jungle-specific threats and overcome extremely restrictive terrain, vegetation and limited visibility engagements that occur at extremely close range. This chapter covers drills applicable to fire teams and squads, with specific considerations for the unique challenges of jungle warfare. Mastery of these drills coupled with steadfast violence of action ensures a decisive response to an engagement and maintaining the initiative.

It may be difficult to ascertain the exact size of an enemy force given the restrictive jungle environment.

5-1. These contact drills will help address the issues that arise from operating in a close country and close engagement environment. They are focused on increasing the success rate of squad-sized operations.

5-2. Engagements within 25 to 50 meters without warning are common in the jungle. The drills taught in this lesson enable the patrol to:

- Initiate immediately or respond to an enemy force while operating as a smaller element.
- Initiate extreme violence quickly to maximize enemy casualties.
- Break contact to reconsolidate or to continue mission.
- Mask the number of friendly personnel or create confusion.
- Make decisions quickly.
- Increase survivability.

5-3. Jungle contact drills are grounded in tactics developed by nations, including the United States, who have been fighting in jungle environments throughout history.

IMMEDIATE ACTION DRILL

5-4. Each one of these battle drills will start with the individual closest to contact conducting the IAD. The procedures for the IAD are as follows:

- Return fire.
- Take a half-step left or right (called the lifesaver step) while returning fire.
- Yell out the direction that contact occurred.

Note. Due to the close combat nature of jungle operations, this is a modified version of the "three Ds" (distance, direction, description). As always, continue to refine communication as the battle progresses. Be aware that some information will not be available during initial contact, such as contact distance. Jungle operations after action reviews have shown that most contact occurs within 25 to 0 meters; this distance should be the working assumption until determined otherwise through leader or METT-TC (I) analysis.

5-5. Weapon carry positions during the IAD are as follows:

- Jungle patrol trail carry. This position increases the speed of putting rounds on target.
- High port carry. This position allows Soldiers to avoid obstacles and vegetation while moving.

FIRE TEAM CONTACT DRILL FRONT

5-6. The procedures for contact drill front are as follows (see figure 5-1):

- The first person (Number 1) will conduct an IAD.
- The second person (Number 2) will take an exaggerated step 90° to the left or right of the point man in the least desirable path. This allows the best terrain or field of dire to the third or fourth person for immediate and maximal return fire on the enemy.

Note. For example, if there is a ridge to the left of the fire team's direction of maneuver, the second person will move towards the ridge. This will help the third and fourth person achieve maximal return fire on the enemy without being restricted by the terrain.

- The third (Number 3) and fourth person (Number 4) move in the opposite direction of Number 2.

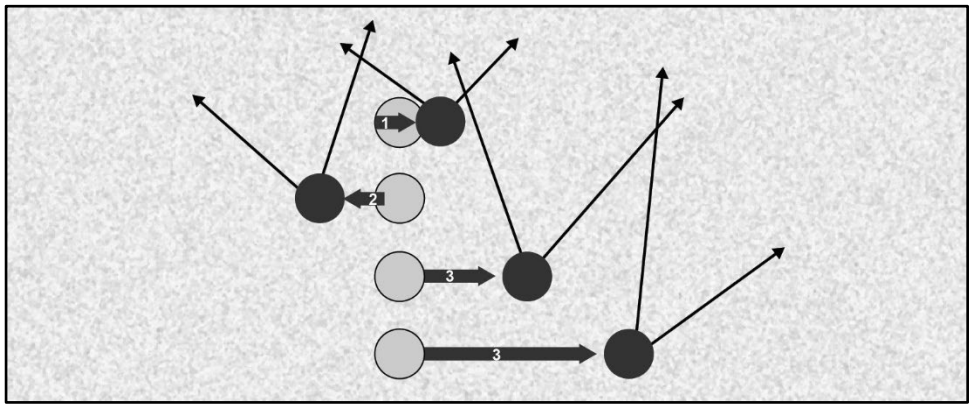


Figure 5-1. Movement and position of fire team upon initial contact

- Number 1 waits until Number 2 is firing to achieve fire and maneuver. Once Number 2 begins firing Number 1 will:
  - Put their weapon on safe and break sight on the barrel.
  - Exaggerate a look to the left and right to identify the other team members' positions.
  - Bring their weapon to high port carry, turn towards Number 2, and successively bound back to Number 2's position.

Note. Smoke grenades may be employed to obscure the enemy and screen friendly movement. If used, remember that dense jungle vegetation tends to bounce back or stop grenades.

- Number 2 will replicate Number 1's actions, except they will turn in towards Number 1.
- Numbers 1 and 2 will repeat these steps until they are roughly on line with Numbers 3 and 4.
- Once the fire team is on line, the third person in the file (usually the team leader) yells "baseline."
- "Baseline" is a cue to conduct a rapid rate of fire for 5 to 7 seconds.
  - At the end of this period, the team will bound in buddy-team pairs. Numbers 1 and 2 bound first, re-performing the actions described in steps 1 and 2. Instead of turning towards each other, they will turn towards the other buddy-team pair (Numbers 3 and 4).
  - The ability to bound will be determined by the amount of effective enemy fire.
  - Numbers 3 and 4 begin to bound when the other buddy-team pair begins to return fire.
- The fire team may bound as many times as necessary until they have moved far enough to have a micro-terrain feature between them and the enemy or until they are out of direct fire.
- Once they have completed bounding, and reach a position where the fire team is roughly on line, the team leader will call "holdline" initiating a rapid rate of fire for 5 to 7 seconds.
- While bounding, the individuals at either end of the line must locate a position to peel left or right.
- When "peel left" or "peel right" is called, the element will move in the indicate direction. The person on the opposite end of the peel (for example, if "peel left" is called, the rightmost person) will use the element as a rail.

Note. When a call is made within the fire team, everyone must echo the call. When "peel left" and "peel right" are called at the same time, follow the loudest call.

- The person on the opposite end of the peel will turn towards the direction of travel, say "last man," and move forward to become the first person in the direction of travel.
  - This individual will pull security facing in the direction of travel once they have moved to the front of the element.
  - They will orient back towards the enemy when relieved by the next person to move forward.
- The element will continue to peel until the reach a break point (something that will take the fire team out of contact, such as cover or favorable terrain.

- When executing the peel, each successive person should wait 3 to 5 seconds after being notified of last man before picking up and moving (see figure 5-2).
- The team members on either flank of the element should shift sectors of fire to the flank to prevent enemies from maneuvering on the element and to clear the fire team's path of travel.

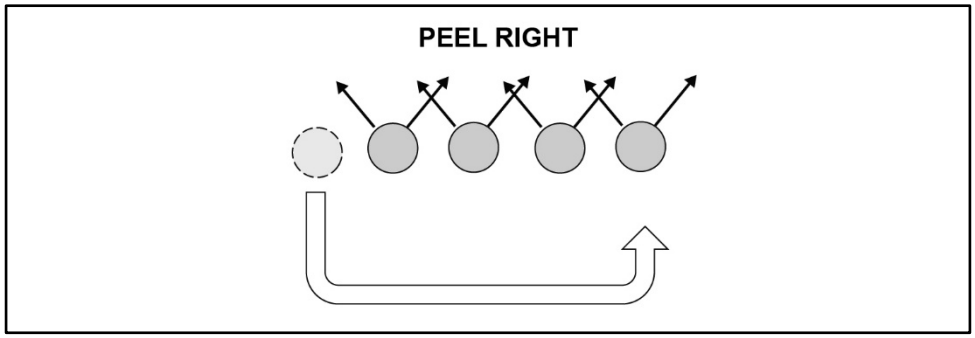


Figure 5-2. Fire team peels right with last man moving right to become lead man in the direction of travel

- When a break point is identified, the person who identifies it will say "break man" or "break point." They are now the lead man.
  - The next person to reach the break point will set shoulder-to-shoulder to the break man and orient themselves in the direction of travel. This person becomes the cover man (CM).
- The next person to reach the break point will determine the direction of travel from the orientation of the CM's barrel.
  - This person will then take one to two steps in the direction of travel and one step off track.
  - They will then orient their barrel in the same direction of the CM (direction of travel).
  - The CM then orients their weapon towards the enemy.
- The next person will flow through the chokepoint created by the CM and the lead man.
  - They will move directly to the lead man and determine the direction of travel from the orientation of the lead man's weapon.
  - They will bump the lead man so they know they are present and take one to two steps in the direction of travel and one step off track opposite that of the previously emplaced person.
  - They will then orient their weapon towards the direction of travel.
  - The lead man they have passed will then orient their weapon to the flank.
- This process is cyclical. Each team member will point out and pull security when another team member moves past the barrel of their weapon. Personnel will face out to the left if on the left side of the element and face out to the right if on the right side of the element (see figure 5-3).

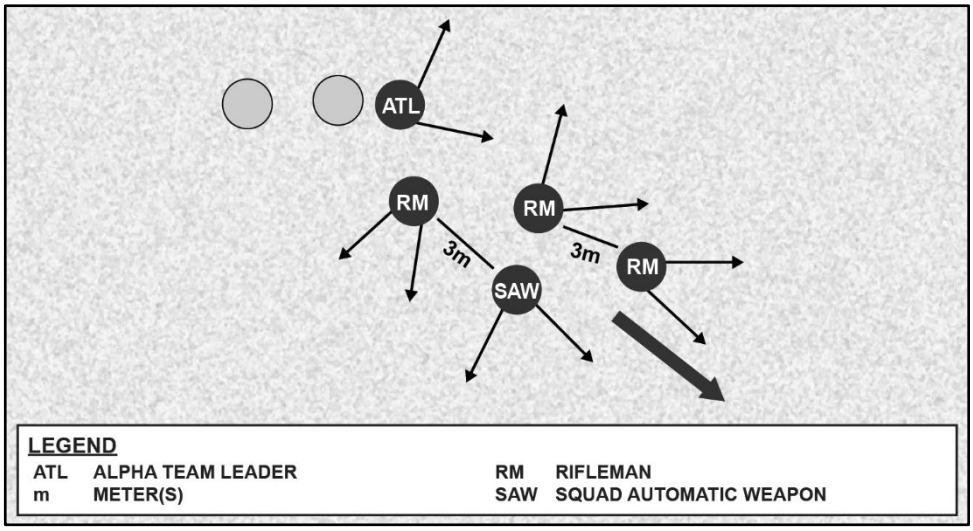


Figure 5-3. Fire team moves through the break point using the "tunnel"

- If the fire team is still in contact after all members have passed the break man, the break man will fire one to two rounds. The break man will break off in the direction of travel once the last man has passed.
- Break point procedures will continue until the element reaches a rally point, which will be called by the patrol leader (SL/team leader).
- At the rally point, the fire team will conduct a hasty MWE (men, weapons, and equipment) check and a map check. This should last no more than 60 seconds.
- The fire team will then move out to a more suitable location to conduct a deliberate MWE check and attempt to contact higher for guidance.

5-7. Considerations include the following:

- If the team is no longer receiving effective fire, the team should move silently without engaging the enemy. Utilize the principle of "silence, violence, silence."
- If a weapon malfunction occurs mid-peel during contact, another team member should immediately replace the team member with the malfunction and engage the enemy (if tactically appropriate and feasible). The team member with the malfunction will pick up and correct the malfunction while they continue movement.
- This contact drill is a method of breaking contact as a small element in restrictive jungle terrain where flanking maneuvers may be difficult or unfeasible. They key to survivability when maneuvering with a small force is to rapidly gain fire superiority and break contact before the enemy realizes that the troop is small in number.

FIRE TEAM CONTACT DRILL REAR

5-8. The procedures for fire team contact drill rear are as follows:

- Fire team contact drill rear follows the same steps as contact drill front. However, contact is initiated from the rear.
- Upon contact, the fire team will turn 180° making the last man the Number 1 and proceed with the drill.

FIRE TEAM CONTACT DRILL FLANK

5-9. The procedures for fire team contact drill flank are as follows:

- Fire team contact drill flank follows the same steps as contact drill front/rear.
- However, since the fire team will be travelling in a file and already be on line, the drill will begin at "baseline."

Note. Upon contact, the fire team will turn in the direction of contact, and each member will take an exaggerated step to the left or right to ensure they are not in the same position as when contact was received.

SQUAD CONTACT DRILL FRONT

5-10. The procedures for squad contact drill front are as follows:

- Alpha Team will carry out a fire team contact drill front up to the baseline. Once at baseline, Alpha Team will conduct a rapid rate of fire for 5 to 7 seconds. Bravo Team will momentarily hold position slightly off the line of march.
  - Bravo Team holding position allows the rear members of Alpha Team to determine their direction of movement.
  - Once the rear members of Alpha Team initiate movement, Bravo Team will move towards the opposite flank, pushing far enough at 90° to the direction of travel that all members of the squad can effectively engage the enemy.
- Alpha Team will move in the individual into buddy-team bounding method as described in the fire team drill until they are roughly on line with Bravo Team.
  - Once the two teams are on line, the Bravo Team member closest to Alpha Tram will call "holdline," which will be repeated by all squad members.
  - If terrain prohibits Bravo Team from getting on line with Alpha Team or from effectively engaging the enemy, Bravo Team may identify and move out towards a rally point ahead of Alpha Team.
  - If the enemy is maneuvering on the element, Bravo Team may provide rear and flank security while Alpha Team maneuvers.
- Once "holdline" is achieved by the squad the squad will conduct a rapid rate of fire for 5 to 7 seconds to further suppress the enemy and screen further movement.
  - The squad will bound away from contact by fire teams until either the person on the far left or far right identifies a suitable location to begin the peel.
  - The far left/right person who identifies the location will call "peel left/right."

- The squad will then peel in the called direction until a suitable break point is identified:
  - The squad will execute break point procedure as described in the fire team drill.
  - Upon reaching a rally point (as designated by the patrol leader, in this case the SL), the squad will conduct a hasty MWE for no more than 60 seconds and map check before moving out and conducting follow-up actions.

5-11. Follow-up actions. These actions are METT-TC (I) dependent. At the rally point, the squad leader will determine the next course of action. These include:

- Executing a squad attack on the enemy if the enemy is small in number, isolated, and fire superiority can be achieved.
- Moving to an alternate rally point for a longer halt to establish communication with higher elements.
- Continuing movement towards the squad objective.

SQUAD CONTACT DRILL REAR

5-12. The procedures for squad contact drill rear are as follows:

- Squad contact drill rear follows the same steps as contact drill front; however, contact is initiated from the rear.
- Upon contact, the squad will turn 180° making the last man the Number 1 and proceed with the drill.

5-13. The procedures for squad contact drill flank follows the same steps as contact drill front/rear, however, since the squad will be travelling in fire team files and already be on line, the drill will begin at "holdline."

CASUALTY RECOVERY

5-14. It is most likely that the point man (Number 1) will become a casualty during initial contact. Casualty recovery procedures are as follows:

- Number 2 and 3 will provide increased covering fire while moving forward.
- The remaining team members will move forward to recover the casualty and their equipment using techniques in accordance with the unit standard operating procedure.
- The recovery team will move to the rear fire team with the casualty.
- Number 2 and 3 will successively bound back to re-join their team.
- Number 2 and 3 will continue to drag the casualty behind the squad as the rest of the squad conducts the remainder of the drill.
- At the rally point, the SL will send a situation report to higher and receive an extraction grid.

Note. If the SL is unable to contact higher, the squad will move to an alternate rally point to make contact with higher and provide further care to the casualty.

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Chapter 6
Weapons Employment

Effective and disciplined use of weaponry is paramount to achieving success on the battlefield, particularly within the restrictive terrain of a jungle environment. This chapter outlines the principles governing weapons employment, from general considerations to specific techniques for maximizing combat power. This chapter examines the effective use of small arms, machine guns, grenades, claymores, and the critical cover shoot technique. Proficiency in these skills ensures Soldiers can deliver accurate and devastating fire, supporting mission objectives.

SECTION I – GENERAL CONSIDERATIONS

6-1. The jungle presents a unique and unforgiving environment, demanding adaptations in every aspect of military operations. Weapon selection, maintenance, and employment are no exception.

6-2. Environmental challenges on weapons:

- Humidity: the relentless humidity of the jungle is a constant adversary to firearms. Condensation can form rapidly, leading to rust and corrosion if weapons are not meticulously maintained.
- Vegetation: dense foliage not only obscures sightlines but also creates a physical barrier that can deflect projectiles, snag on equipment, and hinder movement.
- Limited visibility: the interplay of dense canopy cover and the potential for rapid weather changes can drastically reduce visibility, impacting target acquisition and engagement ranges.
- These factors necessitate a shift in mindset from conventional operating environments. Soldiers must prioritize:
  - Rigorous maintenance: frequent and thorough cleaning and lubrication are non-negotiable to combat the detrimental effects of humidity.
  - Adaptable tactics: dense vegetation demands an emphasis on close quarters combat techniques and an understanding of how foliage impacts projectile trajectories.
  - Heightened awareness: limited visibility necessitates heightened situational awareness, utilizing all available senses to detect threats and navigate effectively.

6-3. By understanding these fundamental considerations, Soldiers can begin to appreciate the specialized approach to weapon selection, modification, and employment that jungle warfare demands.

SECTION II – SMALL ARMS

6-4. This chapter provides guidance on the effective employment of small arms within the unique challenges of a jungle environment.

JUNGLE ENVIRONMENT CONSIDERATIONS

6-5. Dense foliage and unpredictable terrain significantly restrict engagement ranges, emphasizing the importance of close-quarter combat skills.

6-6. The jungle offers ample cover and concealment for both friendly and enemy forces. Maintaining heightened situational awareness and utilizing effective camouflage and concealment techniques are crucial.

6-7. Humidity, rain, and mud can impact weapon reliability and ammunition performance. Regular maintenance and proper storage are essential.

SMALL ARMS SELECTION AND EMPLOYMENT

6-8. Weapon characteristics include the following:

- Reliability: choose weapons with proven performance in humid and wet environments.
- Weight and size: compact and lightweight weapons enhance maneuverability within dense vegetation.
- Rate of fire: a balance between controlled bursts and rapid-fire capability is essential for engaging multiple targets and suppressing enemy fire.

6-9. Ammunition considerations include the following:

- Protection from the elements: utilize ammunition stored in waterproof containers and inspect rounds regularly for signs of moisture damage.
- Penetration: consider ammunition types that can effectively penetrate jungle foliage while maintaining lethality (see figure 6-1).

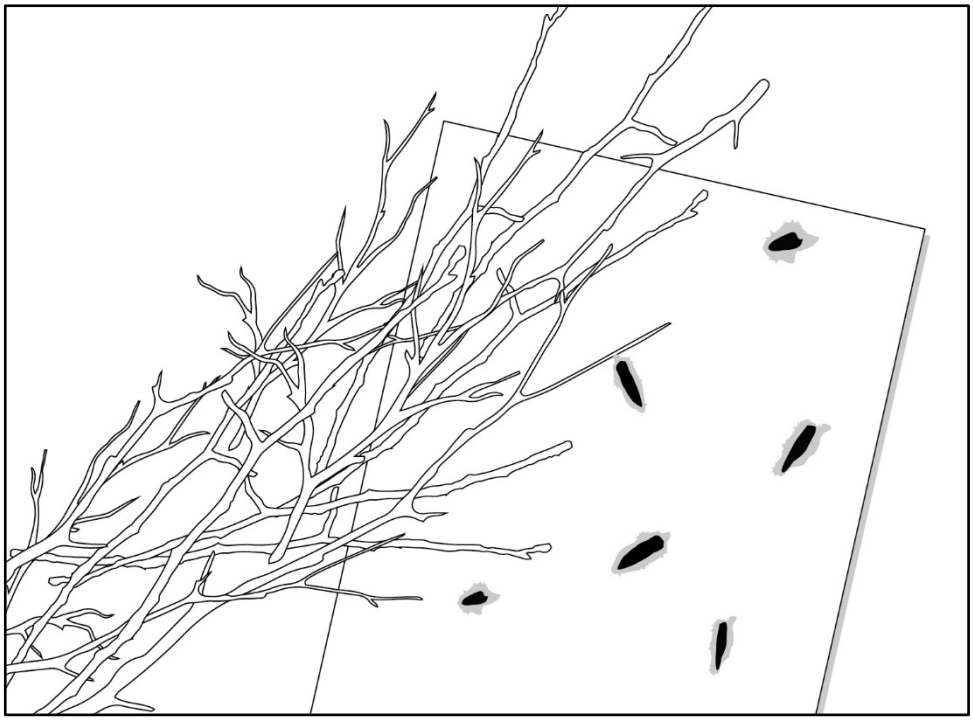


Figure 6-1. Tumbling effect of 5.56 millimeter from vegetation

6-10. Engagement techniques include the following:

- Point and area fire: utilize both techniques effectively, considering limited visibility and potential friendly fire incidents.
- Target acquisition: train extensively on rapid target acquisition in low-visibility environments, utilizing all senses.
- Fire and maneuver: coordinate movement with fire support to close with and destroy the enemy effectively.
- Use of cover and concealment: maximize the use of natural cover and camouflage to gain a tactical advantage.

ADDITIONAL CONSIDERATIONS

6-11. Establish a rigorous cleaning and maintenance routine to combat the detrimental effects of humidity and moisture on weapons.

6-12. Regularly confirm zero and adjust sights as needed, considering the varying ranges encountered in the jungle.

6-13. Conduct realistic training scenarios that replicate the complexities of jungle combat, emphasizing marksmanship, target acquisition, and weapon handling under stress. Understand how the jungle environment affects the weapon system by conducting live fire exercises in the jungle.

6-14. By understanding the unique challenges of jungle warfare and employing small arms effectively, Soldiers can dominate the battlefield and achieve mission success.

SECTION III – MACHINE GUNS

6-15. The jungle presents a unique challenge for military operations, and machine gun employment must adapt to this unforgiving environment. While offering significant firepower potential, the effectiveness hinges on understanding the limitations and opportunities this terrain presents.

6-16. Machine guns, while powerful, are not a universal solution for jungle warfare. Their effective employment requires careful planning, skillful deployment, and an understanding of the terrain's limitations. By adapting tactics and considering the unique challenges of the jungle, machine guns can be a decisive factor in achieving fire superiority and mission success.

ADVANTAGES OF MACHINE GUNS IN THE JUNGLE

6-17. Suppressive fire: the dense vegetation and limited visibility make jungle combat a close-range affair. Machine guns excel at delivering high volumes of fire, pinning down enemy forces and allowing friendly units to maneuver.

6-18. Area denial: jungle trails, stream crossings, and open areas can be effectively interdicted with machine gun fire, disrupting enemy movement and channeling them into kill zones.

6-19. Penetration: while foliage can hinder accuracy, the heavy rounds fired by machine guns offer better penetration through vegetation compared to rifles, increasing the chances of hitting targets concealed within.

CHALLENGES AND CONSIDERATIONS

6-20. Limited fields of fire: dense vegetation restricts visibility and creates numerous natural bunkers for the enemy. Careful positioning and selection of firing lanes are critical for maximizing effective fire.

6-21. Logistics and mobility: machine guns and their ammunition are heavy, posing logistical challenges in dense jungle terrain. Units must balance firepower with mobility, potentially employing smaller caliber weapons for patrols and relying on heavier guns for defensive positions.

6-22. Overheating and barrel life: sustained fire can lead to overheating and reduced barrel life, especially in humid jungle conditions. Gunners must manage their rate of fire and implement proper maintenance routines.

6-23. Sound discipline: the enclosed environment amplifies sound, making machine gun fire easily detectable. Units must balance the need for suppressive fire with the risk of attracting unwanted attention.

SPECIFIC EMPLOYMENT TECHNIQUES

6-24. Ambush and counter-ambush: machine guns play a vital role in ambushes, delivering devastating fire onto enemy patrols caught in the open. They are equally crucial in counter-ambush situations, providing covering fire and allowing friendly forces to break contact.

6-25. Defense: emplaced machine guns, especially along likely enemy avenues of approach, provide formidable defensive capabilities. Utilizing natural cover and camouflage is essential to maximize their effectiveness and survivability.

6-26. Riverine operations: machine guns mounted on boats provide valuable fire support during riverine patrols and assaults, engaging enemy positions along riverbanks and providing cover for Soldier landings.

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Chapter 7
Dismounted Combat Tracking

The ability to locate and follow enemy movement is a vital skill for any unit operating in a contested environment, especially within the dense confines of a jungle. This chapter details the art and science of dismounted combat tracking, focusing on identifying and interpreting signs of enemy activity. This chapter covers tracking techniques, countertracking measures, essential terminology, and the different types of tracking employed in a tactical setting. Mastering these skills provides a significant advantage in locating, engaging, and disrupting enemy operations.

SECTION I – GENERAL

7-1. Visual tracking is the skill of being able to follow a person or group of people from the sign they have left. It is a precise skill, and all trackers require considerable practice if they are to achieve and maintain a high standard. There is an obvious requirement to be able to interpret signs left by an enemy as this yields vital information. Units should endeavor to have enough qualified trackers when deployed. This skill is not confined to the jungle environment as it can be adapted for use in any theater.

7-2. Tracking has been employed in numerous military campaigns. It was used to great effect in the Malayan Emergency, the Borneo Confrontation, Vietnam, Southern Africa, East Timor, and Bosnia. Wars in Iraq and Afghanistan have shown the utility of tracking. Countless reports of successful operations in these areas have been associated or accredited either directly or indirectly with the intelligence gathered by the trackers or ground sign-aware Soldiers.

7-3. In an environment where information on the enemy is limited and where most of the movement is concealed, the primary means of intelligence gathering is patrolling. It should be the commander's intent to find, fix, strike, and exploit the enemy wherever he may be. The importance of tracking therefore cannot be underestimated as each and every sighting or contact with the enemy must be followed up to fulfill the commander's intent. The main purpose of military tracking therefore is to gain and pass onto commanders as much information as possible about the enemy by employing tracking techniques to mount subsequent military operations.

7-4. The options for establishing a tracker platoon are as follows:

- In a jungle environment task organize elements of the antitank platoon as the tracker platoon. This option has obvious advantages as the armored threat is greatly reduced therefore manpower could be provided without losing a capability elsewhere.
- Train the reconnaissance platoon as a tracker platoon. This would require the reconnaissance platoon to fulfil two roles although it has several advantages as follows:

  - The Soldiers within the reconnaissance platoon generally have the high level of individual soldiering skills required by a tracker.
  - The platoon is established and has all the equipment required by a TT.
  - On discovering an enemy objective, the team would be experts in the conduct of close target reconnaissance and would not require additional training.
- Convert a section per company into a TT, and either keep them attached to that company or group them together as a platoon under the battalion HQ.

SECTION II – TYPES OF TRACKING

7-5. There are two types of tracking that have important aspects in providing a complete picture of the targets being tracked.

VISUAL TRACKING

7-6. Visual tracking is the skill of being able to track a person or animal by the signs and marks they have created. Examples are:

- Changes in the color and the unnatural formation of vegetation due to disturbance.
- Bruises, breaks, and cuts in vegetation.
- Water in areas that are normally dry.
- Lack of water or dew on vegetation.
- Mud or soil on grass or bushes.
- Footprints in muddy ground.
- Sap from a bruised root or trunk of a tree.
- Disturbance to animal, bird, or insect life.

7-7. Since the visual tracker (VT) relies primarily on sight, the VT is unable to track at night except in very unusual circumstances, for example, brilliant moonlight, artificial light in open country, or with the use of night observation devices and if the tactical situation allows.

SCENT TRACKING

7-8. Scent tracking is normally performed by dogs; however, scent can also assist a well-trained tracker in his pursuit of the target whether human or animal, provided the scent is strong and fresh. In addition, the VT uses sense of smell to warn of any foreign scent in the area, for example:

- Cooking smells.
- Smoke.
- Latrines.
- Newly dug earth.
- Perfume smells from toiletries.

QUALITIES OF A TRACKER

7-9. Generally, trackers are the most efficient in their country of origin; they move them from their natural environment and their efficiency deteriorates until such time as they

become accustomed to their new surroundings. However, there are certain fundamental factors that apply to tracking irrespective of the country, which are apparent to the trained tracker, remaining hidden to the untrained. Nobody is born with the natural instincts of a tracker, however, contrary to the common belief a tracker is not a special type of person. A tracker is a Soldier who has attained these skills through dedication, practice, and hard work. It is possible for anyone to become proficient in the skill of tracking provided they are determined and interested.

7-10. The tracker is a highly trained Soldier who can locate, identify and pursue sign and as a result form intelligent interpretations and assumptions about the target. Qualities of a tracker include the following:

- Honesty.
- Patience.
- Perseverance.
- An inquisitive mind.
- Acute observation.
- Determination (mental and physical).
- Above average endurance.
- Above average standard of fieldcraft.
- Knowledge of the enemy and his tactics.
- Knowledge about the local flora and fauna.

7-11. With patience and perseverance, it is possible for any Soldier with the right attributes to be trained as a tracker. It is essential that a tracker has a sound understanding of the types of tracking, and the basic terminology used before the Soldier learns the elements of tracking (EOTs).

SECTION III – ELEMENTS OF TRACKING

7-12. EOTs is a term used to describe the four main aspects of tracking, particularly when training trackers. The tracker should fully understand the EOTs, as these are the core skills and fundamentals of tracking. The four main EOTs are:

7-13. EOT 1—Signs–which aims to define the characteristics, categories and classifications of sign.

7-14. EOT 2—Factors Which Affect Tracking–which aims to outline how sign is adversely affected by the elements.

7-15. EOT 3—Judging the Age of Sign–which illustrates procedures and considerations when determining the age of sign.

7-16. EOT 4—Information Gained from Sign Tracking–which establishes exactly what information can be obtained through the application of tracking techniques.

ELEMENT OF TRACKING 1—SIGN

7-17. Sign can be defined as any evidence of change from the natural state that is inflicted upon the environment by the passage of human, animal, or machinery. Sign is visible to all; however, to most people, the uninitiated, they do not always recognize the significance of what they are looking at.

CHARACTERISTICS

7-18. The ability to recognize sign is fundamental to being able to track, and the tracker who fully understands what sign the tracker is looking for can tune in and track in all environments and in all weather conditions (see figures 7-1 to 7-6 on pages 60 to 65). All sign therefore may be identified by one or more of the following characteristics:

- Regularity is an effect caused by straight lines, arches or other geometric shapes being formed and leaving marks not normally found in nature.
- Flattening is the general levelling or depression caused by pressure on an area and is identified through a comparison with the immediate surroundings, for example:
  - Boot prints on grass.
  - Where someone has sat down or placed heavy equipment and so forth.
- Transfer is a deposit carried forward over an area after the target has moved from one environment to another, for example, mud, sand, grass, water, and so forth.
- Color change is the difference in color or texture from the area that surrounds it, for example, overturned leaves.
- Discardable are any materials 'cast off' (intentional or otherwise) by the target, for example, rations, packaging, equipment.
- Disturbance is any other change or rearrangement of the natural state of an area caused by the passage of the target, for example, insect/animal life, dead leaves, bruised roots.



Figure 7-1. Sign – regularity



Figure 7-2. Sign – disturbance



Figure 7-3. Sign – flattening



Figure 7-4. Sign – discardables



Figure 7-5. Sign – transfer of sand



Figure 7-6. Sign – color change (leaf overturn)

CATEGORIES

7-19. Once the tracker has developed the ability to recognize the characteristics of sign, the tracker has acquired the primary skill required of a tracker. While tracking all sign is divided into two categories with the dividing line taken at ankle height. The two categories are top sign and ground sign.

7-20. Top sign is above the ankle to the height and width of the person and equipment the person may be carrying. Examples of top sign are:

- Broken twigs or leaves.
- Scratches on tress and rocks.
- Hand holds on trees.
- Changes in color and unnatural position of vegetation.
- Cutting.
- Rope marks on a tree from a hammock.

7-21. Ground sign is a sign left mainly by the feet or equipment placed on the ground. It refers to all sign below ankle height. Examples of ground sign are:

- Foot or boot marks.
- Broken twigs or leaves on the ground.
- Bruised or bleeding roots.
- Disturbances of insect life on the ground.
- Disturbances of grass or ground vegetation.
- Mud, and so forth, deposited from boots.
- Disturbed leaves, stones, and twigs on the ground.
- Discardables.
- Disturbed water.

CLASSIFICATION OF SIGN

7-22. In any environment the tracker can identify sign because animals or people may have been in the area prior to or since the target. It is essential that the tracker can identify what sign belongs to the target and to discount foul sign. When pursuing sign, the tracker designates all sign into one of two classifications as follows:

- Conclusive sign indicates to a tracker the passage of the target through the area, for example, a footprint, discardable or cutting; in other words, sign that is made by the target.
- Inconclusive sign may or may not have been caused by the target (not definite).

DYNAMICS OF FOOTPRINTS

7-23. The ability to interpret footprints and action indicators can play a vital role in tracking. Piecing together the information helps formulate a picture that, together with intelligent assumption can provide accurate intelligence. In certain terrains the distinct footprint is a rare find, knowledge of the footprint and its indicators allow the Soldier to gain increased knowledge about the enemy and use it to their advantage.

7-24. Basic elements to every footstep: primary impact point and terminal point (TP).

7-25. Primary impact point: The first part of the foot that strikes the ground whether the individual is walking forward or backwards. The heel dig may be prominent and sharp when walking forwards, when walking backwards the toe digs in first (see figure 7-7).

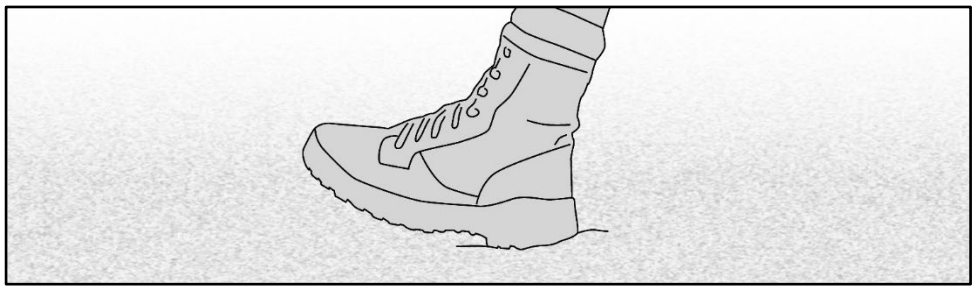


Figure 7-7. Primary impact point

7-26. Foot roll: As the foot rolls forward, the heel markings are more prominent than the remainder of the sole due to the pressure laid down onto the heel (see figure 7-8).

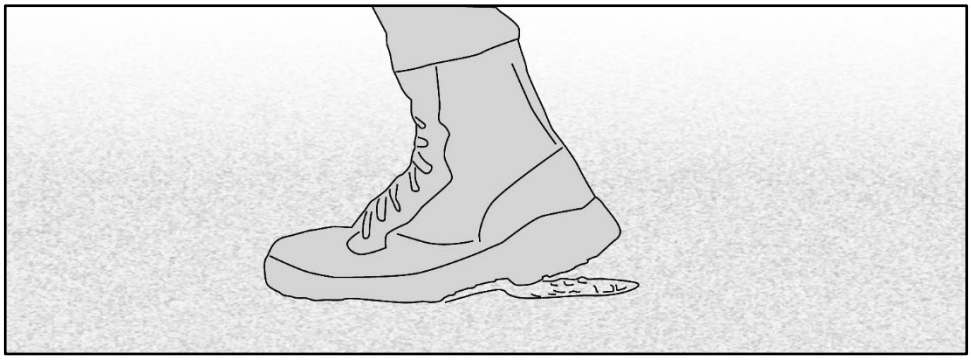


Figure 7-8. Foot roll

7-27. Heel strike: The heel of the second foot strikes the ground creating a primary impact point as the first foot completes the roll.

7-28. Pre-TP: The weight is shifted forwards on the toe of the foot.

7-29. TP: The last point of the foot as it leaves the ground. As weight and power transfer to the other foot, there is a certain amount of toe drag as the foot moves. Over the right terrain, these characteristics show a rising of the soil under the foot, distorting part of the imprint of the sole (see figure 7-9).

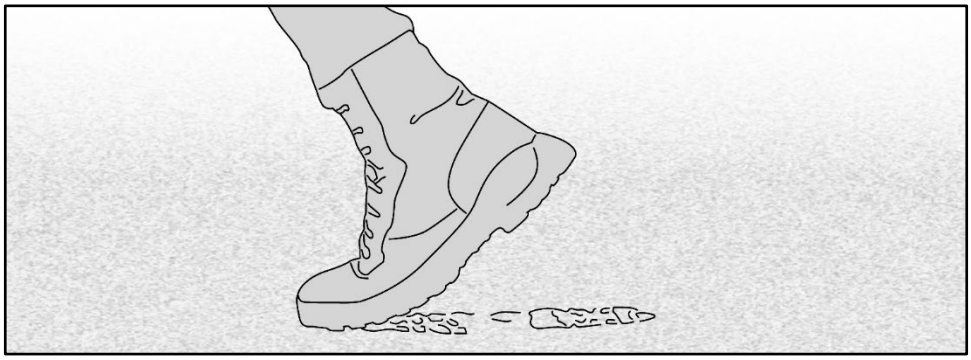


Figure 7-9. Terminal point

7-30. It is possible to gauge the activity of the quarry by studying a series of footprints. Every time a new activity takes place, the five-action indicators change (see figure 7-10 on page 68). The five-action indicators are as follows: stride, pitch angle, straddle, pressure, and dwell time.

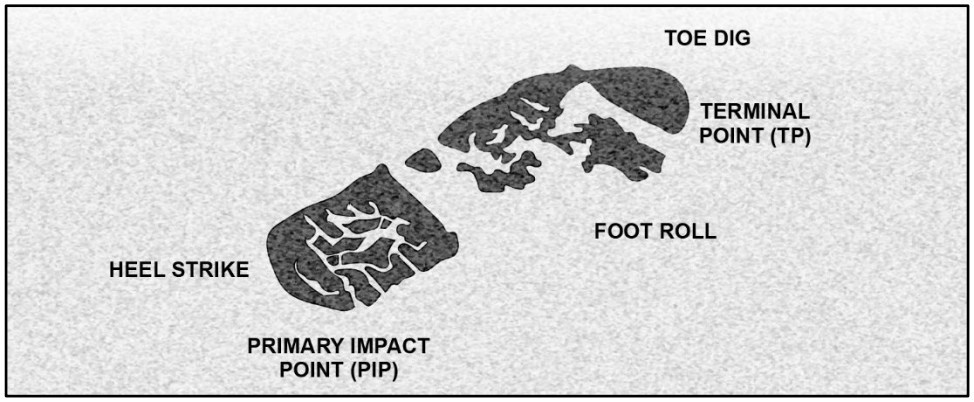


Figure 7-10. Dynamics of footprint

7-31. Stride: The distance from heel to heel. A person's stride can vary as much as 4 to 6 inches as terrain and other circumstances change.

7-32. Pitch angle: This is the angle of the foot that pitches out from the line of travel, for example, whether their toes point inwards or outwards. The angles are referred to as a positive (point outwards), neutral (straight) or negative (point inwards) pitch angle. All individuals differ on the pitch angle; there is some evidence to support the claim that females have a certain amount of a negative pitch angle although this would depend on the female. Every person is unique in the way they angle their feet as they walk.

7-33. Straddle: The inner distance between the left and right foot. Straddle varies depending on the person's activity; running creates a narrower straddle as does walking slowly with a heavy load (see figure 7-11).

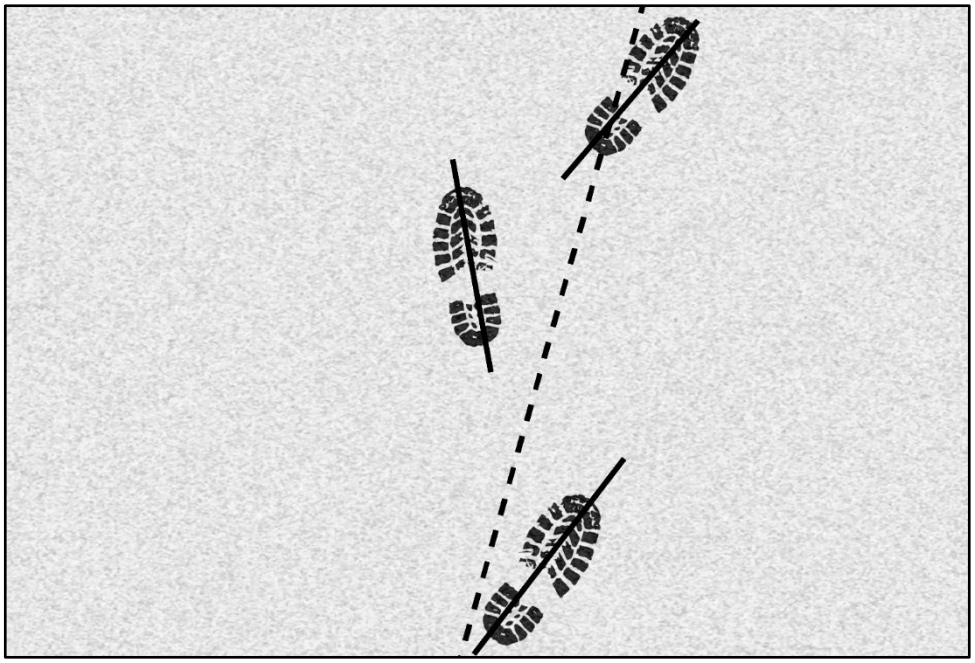


Figure 7-11. Straddle

7-34. Pressure: The weight of the body through the foot making a depression onto the ground by the pressure of weight. Heavier people and those carrying heavy loads have more pressure creating deeper footprints in the terrain. Likewise remaining still in the same place for longer periods of time creates more pressure.

7-35. Dwell time: This is the amount of time the foot is on the ground at the same location. The pressure and dwell time tend to go hand in hand.

7-36. Using the dynamics of a footprint, action indicators, and recognizing the differences that occur when activities change, a competent Soldier could quickly and fairly accurately identify the activities of the quarry. Namely: speed of movement, accelerating into a sprint, fast running, and size and weight.

7-37. Speed of movement: Information gained could show that the quarry is dawdling, strolling, walking slow, fast, striding out, jogging, running, or sprinting.

7-38. Accelerating into a sprint: The action indicators would change dramatically as the quarry develops the pace. The stride length increases: the dwell time and pressure are less onto the ground and the pitch angle would change from a positive to a neutral angle as the individual increases in speed. Disturbance onto the soil is visible as the ball of the foot and toe dig is evident, but only as they have moved into the sprint (see figure 7-12 on page 70).

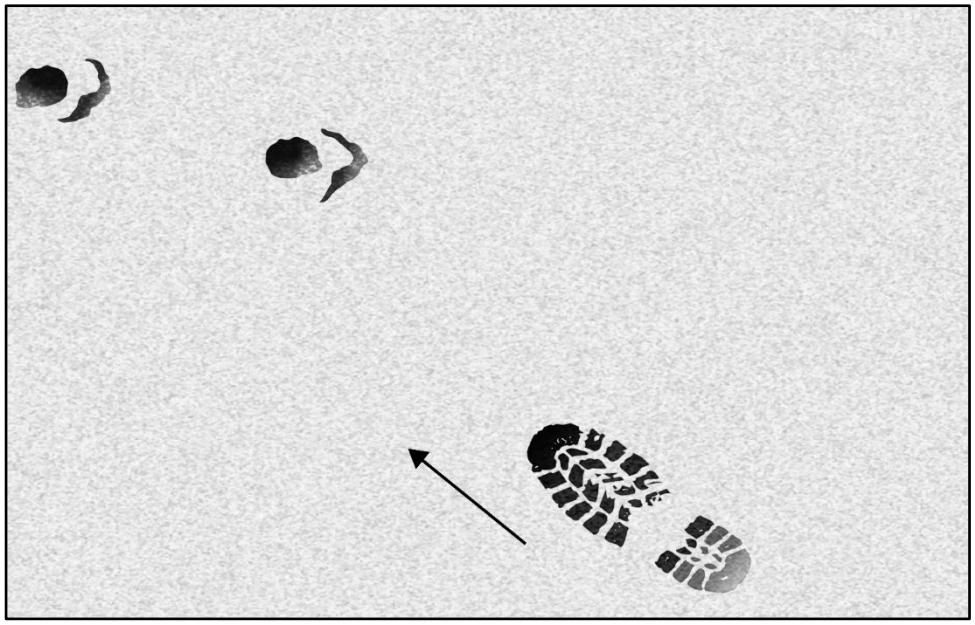


Figure 7-12. Accelerating into a sprint

7-39. Fast running: The stride length is generally at its maximum and the pitch angle is near neutral. Differing styles mean that some individuals run on the balls of their feet and others place their full foot down (see figure 7-13).

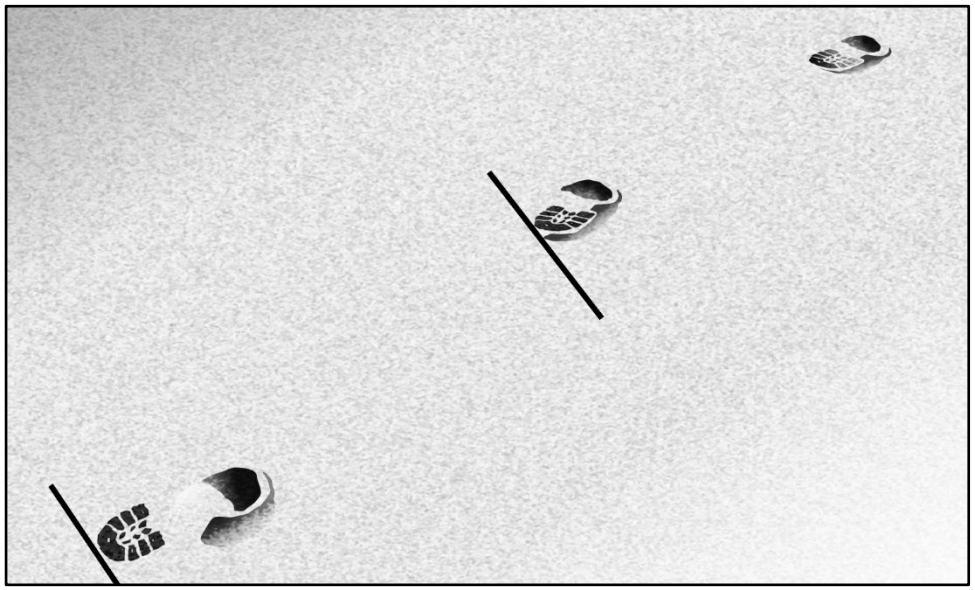


Figure 7-13. Fast running

7-40. Size and weight: Key information found on the ground would indicate what size and weight the quarry is based on the dwell time and pressure. If the person is heavy or carrying weight, then there would be depth to the footprint and more prominence as the individual travelled forward. Should a person be carrying weight, then the straddle could well be narrower for the body to adapt to the added weight. The edge of the footprint is sharper in difference too if the person stood on the same spot as the edge would not build up any soil. Different terrain presents different sign. Roughly speaking, a measurement of the foot in inches and then divided by two would be an assumption as to the individual's height for example. Foot length is 12.5 inches/2 equals approximately 6 feet, 2 inches tall.

TRACK TRAP

7-41. An area that is conducive to leaving and retaining good sign or spoor. How a tracker determines conclusive and inconclusive sign varies between trackers and is dependent on the tracker's experience. A novice may require several characteristics of sign to be convinced that the same person/target is being pursued. With experience and practice, a tracker requires fewer or less characteristics to pursue the target and treats what the tracker once considered inconclusive sign confidently as conclusive sign.

SUMMARY

7-42. A good understanding of sign, and how to identify it, assists the tracker during the initial learning stages of the course. EOT 1 is the most important part of visual tracking, and it must be remembered that some people may not have the aptitude. With experience and practice locating and identifying sign becomes easier.

ELEMENT OF TRACKING 2—FACTORS WHICH AFFECT TRACKING

7-43. There are four main factors which can affect tracking, and they are all very closely related. This can be advantageous and disadvantageous for the tracker. It is imperative that the tracker has a thorough understanding of each of the four factors and anticipates how each one can affect the others. The four factors which affect tracking are: sign and spoor, terrain, climatic conditions, and time.

SIGN AND SPOOR

7-44. Tracking the target's sign is the most important thing to consider but, to remain on the correct sign, a tracker must consider foul tracking by other human sign, or by animal spoor.

Animal Spoor

7-45. A tracker must consider animal life in the area and know how to differentiate between animal spoor and human sign. For example, most hoofed animals make a distinct chop-mark as they walk. The shape of the hoof acts like a knife-edge and the way animals distribute their body weight onto the hoof causes it to cut into the ground. By contrast a human tends to create heel and toe movements when walking. As humans place their feet down the heel is the first part to touch the ground. As they are moving, their weight is being transferred from the heel onto the ball then onto the toe, which

means the weight is being displaced evenly over the foot. For example, if a wild pig stood on a stick, it would cause one clean break due to the cutting motion by which the pressure is applied, however a human would invariably cause two, one on either side of the foot due to the way the weight is distributed (see figure 7-14).



Figure 7-14. Animal spoor

Other Human Sign

7-46. If there is other human sign in the area, the tracker must determine through the sign pattern that the tracker has identified which quarry to pursue (see figure 7-15).



Figure 7-15. Other human spoor

TERRAIN

7-47. The terrain in which the target is operating has an impact upon the amount and type of sign produced. The characteristics are equally applicable; however, the tracker must have a comprehensive knowledge of what type of sign is likely to be prominent in different terrain and tune in accordingly. Tracking can be conducted in any environment. The following can be used as a guide: grassland, rocky country, primary jungle (rain forest), secondary jungle (scrub), coastal and estuarine jungle (rivers and streams, marshy and swampy ground), and sand.

Grassland

7-48. If the grass is high, for example, above 3 feet, tracks are relatively easy to follow since the grass is knocked down and stays down for some time, depending on the weather. If the grass is short, it springs back into its original position in a relatively short space of time (see figures 7-16 to 7-19 on pages 74 to 76). The following points assist when tracking in grassland:

- Pointer: grass is normally trodden down and pointing in the direction the target is travelling, presenting a contrast in color to the normal undergrowth when pressed down.
- Color change: if the grass has been wet with dew the night before, the dew is rubbed off.
- Transfer: mud or soil from footwear may appear on some of the grass.
- If it is dry grass broken and crushed stems are found. Footprints are normally found in dry grass areas.
- If new vegetation is showing through, it indicates the track is an old one.

- In very short grass a boot damages the grass near the ground and invariably a footprint or impression is found.



Figure 7-16. Grassland “knock down”



Figure 7-17. Transfer of the sand



Figure 7-18. The dew rubbed off



Figure 7-19. Flattening and color change of the grass

Rocky Country

7-49. Tracking through a rocky country is not as difficult as is imagined because rocks are both easily disturbed and are generally easily marked. The following are some points to consider in this type of country:

- Unless moving over large boulders, stones or rocks either move aside or roll over.
  - This disturbs the soil, leaving a distinct variation in color and an impression.
  - If wet, the underside of the stone and rock is darker in color, and if dry, a much lighter color.
- If moving over large stones the base of the boots tends to scratch the surface of the rocks.
- On sandstone, boot marks tend to show dark in color, and on lava, the marks are white.
- If the stone is brittle, it normally chips and crumbles when walked on and a light patch appears. The pieces of stone that have chipped off should also be seen nearby.
- Stones on the side of hills move slightly or roll away when walked on, regardless of whether the target is moving up or down hill.
- Stones on a loose or soft surface are normally pressed into the ground when walked upon, leaving either a ridge around the edge of the stone where it has forced the dirt out, or a hole where the stone has been pushed below the surface of the ground.

Primary Jungle (Rain Forest)

7-50. Within the primary jungle, trackers find many mediums which readily show sign. These include the undergrowth, live and dead leaves and trees, streams with muddy or sandy banks, moss on the forest floor and rocks (see figures 7-20 to 7-22 on pages 78 to 79). Tracking in the rain forest is assisted by observation of the following details:

- Wet leaves on the forest floor when disturbed show up as being much darker than those that are undisturbed.
- Dry leaves when undisturbed show a distinct bleached upper surface whereas the underside is dark brown. Therefore, disturbed dry leaves leave a significant dark color change.
- Dead leaves often become very brittle and crack or break under the pressure of a person walking on them. The same can be said for small dry twigs.
- Where the undergrowth is thick, especially on the edges of the forest, the target may have to push through the vegetation. Bushes and branches with green leaves that have been pushed aside and twisted expose the underside of the leaves which are lighter in shade than the top of the leaf.
- To the trained eye this is prominent. However, when looking for this type of sign the tracker must look through the vegetation and not at it.
- Broken twigs assist the tracker in assessing how long it has been since the track was laid. Freshly broken twigs, green or dead, tend to portray a cream color at the break and fine hairlike strands of wood. The color at the break will get darker and the fine strands dissipate with time, but if the tracker breaks the twig again, the tracker gets an indication by comparison of how long it is since the original break occurred. Only by experiment and experience will the tracker be able to determine the age of the break. Freshly broken green twigs usually retain the smell of sap for up to 3 or 4 hours.
- Boot impressions are left on fallen rotten trees if walked on.
- When logs lay across a path, there are generally marks on the log or either side of it.
- Where roots are stepped on, they often show bruising marks.
- Broken cobwebs across the path may indicate the passage of animals or humans.



Figure 7-20. Bruised root



Figure 7-21. Crushed dead log



Figure 7-22. Over-turned leaf

Secondary Jungle (Scrub)

7-51. This is the type of country where the primary growth has been cleared, and the secondary growth has started. Usually, it is very thick and difficult to penetrate. To do so the individual may be forced to make a way through by either cutting or crawling along at ground level. When tracking in it, the main points to watch for are the following:

- Broken branches and twigs.
- Leaves knocked off branches.
- Color-changed leaves or small branches facing the direction in which the target has travelled.
- Footprints on the ground which show up clearly as grass does not grow underneath.
- Tunnels made very low to the ground.
- Broken cobwebs.
- Pieces of clothing or equipment caught on sharp edges of vines, bushes, and so forth.

Costal and Estuarine Jungle

7-52. The term coastal and estuarine jungle is taken to include rivers, streams, and marshy and swampy ground. The most likely forms of sign to be located are as follows:

- Footprints on the banks.
- Footprints in shallow water or in mud.
- Discolored water from stirred up mud.

- Rocks splashed with water in a slow moving/small stream.
- Water on the ground at the exit point.
- Boots may have been taken off to wade the stream.
  - Look for spots on banks where this was done and where they were put on again.
  - Normally there are signs indicating where the person sat down to take off and put on boots.
- In mangrove swamps mud will be stirred up. Also branches of mangrove will be bent where people have held onto them to prevent themselves from tripping over roots.
- Areas of color change on river/stream beds indicating where the target has passed.
- Top sign in the form of color change where the target has pushed through tall reeds, and so forth.

Sand

7-53. Sand is relatively easy to track on. The biggest problem with the tracker is that rain and wind can obliterate marks and impressions within a couple of minutes (see figures 7-23 to 7-25 on pages 80 to 81). The main points to be considered are as follows:

- If the surface is reasonably hard, the footprint is very clear.
- If the surface is soft the footprint will be quite deep and in the early morning and late afternoon the walls of the impression may cast a shadow.



Figure 7-23. Stream bank

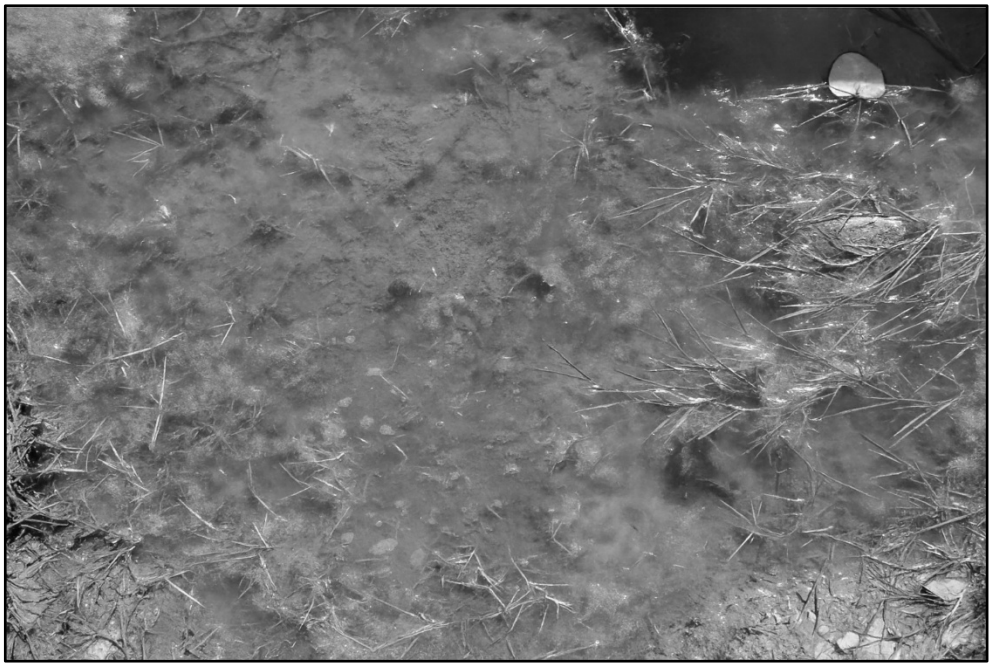


Figure 7-24. Murky color in disturbed water

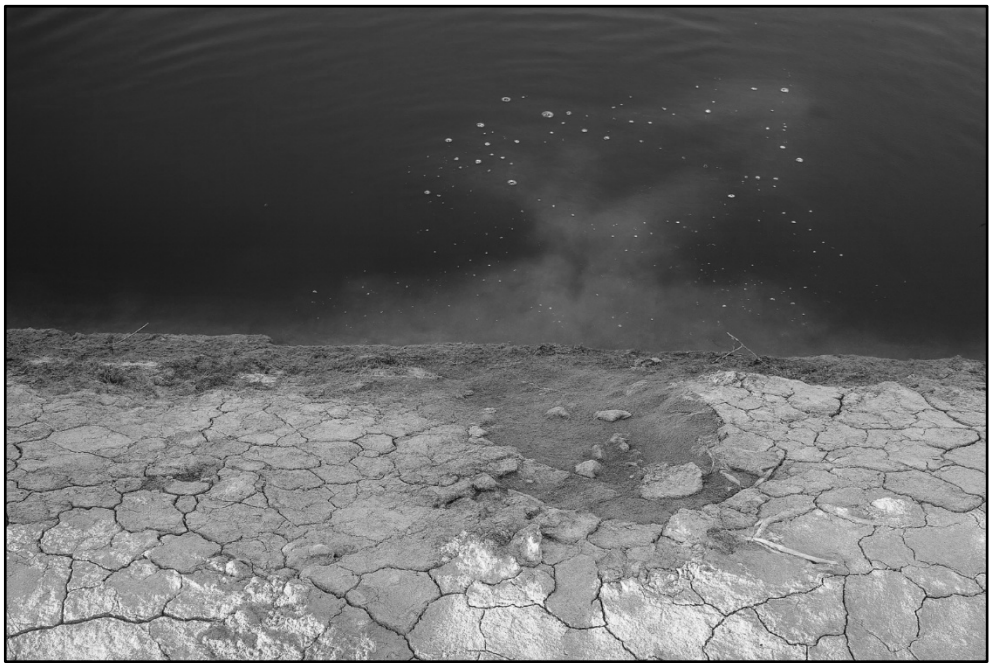


Figure 7-25. Riverbank downhill

CLIMATIC CONDITIONS

7-54. In tropical areas the weather can change rapidly between sun, rain, and strong winds. Prolonged periods of either of these conditions can exist, such as in the monsoon and dry seasons. However, each of these climatic conditions, either taken singularly or combined, have an adverse effect on sign and can make the task of the tracker more difficult. The following climatic conditions should be considered:

Direct Sunlight

7-55. The average temperature in tropical areas is between 30º to 40ºC. In open areas such as grassland, or in exposed areas in the jungle, such as an LP or large bend in the river, direct sunlight will greatly affect sign. The heat accelerates color change to a far greater extent than in covered areas, for example an overturned leaf which is damp will quickly dry, or the darker side of an overturned dry leaf will become quickly bleached. However, in certain circumstances direct sunlight can be an aid, for example in disturbed areas it can produce a contained shadow.

Strong Wind

7-56. Strong winds are a frequent occurrence, especially prior to heavy rain, and although not always felt by Soldiers operating within thick jungle, strong winds cause a great deal of disturbance to the vegetation. In exposed areas it encourages disturbed vegetation to return to normal, for example, blow it or the vegetation around it into different positions. Strong wind may even conceal some ground sign by blowing vegetation on top of it.

Heavy Rain

7-57. The average annual rainfall in most of the tropical areas is around 500 centimeters (180 inches) per year. Rain occurs frequently in primary jungle hence the name rainforest. However, most of the rain falls during monsoon seasons. Thick clouds also reduce light therefore affecting visibility reducing the tracker's ability to see sign considerably. Heavy rain washes out some sign very quickly, particularly ground sign, and is the most challenging climatic condition for a VT.

TIME

7-58. To be able to assess the time between when the sign was first made and when it was located is the hardest part of a tracker's task. Full details on how to judge the age of sign are given at EOT 3, however, experience and practice help to overcome this difficulty. The longer the time span since the track was laid and the time of discovery, the more chance there is of the track becoming fouled or flawed by climatic conditions.

OTHER CONSIDERATIONS

7-59. In addition to the factors in paragraphs 7-55 to 7-58, there are several additional considerations that affect a tracker's ability. The two main considerations are:

Animal Life

7-60. Within a jungle environment the amount and type of wildlife both assist and hinder tracking operations. In many countries, birds, insects, and mammals will warn other animals of impending danger from intruders. Monkeys are particularly proficient at shouting a warning when they see humans in the jungle. Insects on the other hand tend to go silent as a means of warning. A firsthand knowledge of the habits and nature of wildlife assists a tracker in the application of his task. Large groups of animals between the tracker and the target can cause foul track so badly that pursuit becomes almost impossible. In this instance a tracker should consider applying the following drill:

- Look for a likely exit point.
- Isolate the track.
- Carry out a likely area search.

Tracking in Built-up Areas

7-61. Built-up areas, including villages, roads, and so forth, cause additional problems for trackers. A track leading towards a village may indicate a release point with other forces, familiarity with the locals, or that the enemy target area is close. Tracking in these areas will invariably involve significant foul track and will slow down most trackers. However, the tracker may speed up his pursuit by carrying out a process of isolation procedures as follows:

- Locate the entry and exit point.
- Conduct a likely area search.
- Look for the presence of the sign pattern being pursued.

SUMMARY

7-62. Each of the four main factors will affect the sign created by the enemy. It must be remembered that the type of sign will vary in different types of terrain. The tracker must take time to tune in and anticipate climatic conditions and time. The most important thing to remember is what can adversely affect tracking.

ELEMENT OF TRACKING 3—JUDGING THE AGE OF SIGN

7-63. A tracker must be able to accurately judge the age of the sign if the tracker is to fulfill the role. The ability to judge the age of sign accurately only comes with experience and continual practice, however it is a vital skill which assists the tracker in the following ways:

- It enables the tracker to determine the approximate time frame since the target passed through the area.
- When tracking it is essential that the VT can determine if the target is in proximity to prevent unnecessary casualties to the TT; judging the age of sign will assist the VT in deciding whether—
  - The VT is gaining on the target.
  - The VT is continually falling back.

- Deducing which sign is the same age as the target's sign assists the tracker in overcoming the problems of foul track.
- It assists commanders in deciding whether or not the team should continue on track.

CONSIDERATIONS

7-64. As stated in EOT 2, a VT must understand local flora and fauna and the relationship between these, as well as a knowledge of the weather and terrain in the AO. All these factors determine the ageing process of sign found. When judging the age of sign the following factors must be considered:

The Type of Sign

7-65. Sign will age to differing degrees depending on whether the sign is hard or soft as follows (see figures 7-26 to 7-31 on pages 84 to 87):

- Hard sign: examples of hard sign are marks in sunbaked soil, marks on stones, or marks in resilient mosses or tussock grass.
  - Discardable such as plastic or metals are also considered hard sign.
  - Hard sign takes longer to either deteriorate or return to normal therefore the tracker is likely to identify hard sign for a longer period than soft sign.



Figure 7-26. Sun baked (hard sign)



Figure 7-27. Crushed rock (hard sign)



Figure 7-28. Disturbed moss (hard sign)



Figure 7-29. Discardables from ration pack (hard sign)



Figure 7-30. Transfer from the rain on leaf



Figure 7-31. Sign after rainfall (soft sign)

- Soft sign: examples of soft sign are marks in soft soil, mud, or sand, and marks inflicted upon green leafy plants.
  - Food discardable such as rice is also considered soft sign.
  - Soft sign deteriorates or returns to normal more quickly than hard sign so the tracker knows that if the tracker is identifying soft sign, then the tracker is closer to the enemy.

Exposure

7-66. The degree of exposure to the elements has differing effects on the sign. In areas exposed to direct sunlight and heavy winds sign change rapidly (return to normal/age) which must be considered by the tracker. In exposed areas trackers may find that they are tracking on minimal sign and realize that when judging the age of sign any sign found is likely to be fresher than it appears.

Weather

7-67. The condition of the sign is directly connected with the weather conditions it has been subjected to. The tracker knows if the track was laid before or after heavy rain or showers.

METHODS EMPLOYED

7-68. Having considered the type of sign, its degree of exposure and the weather it has been subject to, the tracker could use one of the following methods to assist in judging the age of sign:

Comparison of Color

7-69. The VT should compare the color of the sign in relation to the color of the surrounding area for color change. Good areas to look for color change are:

- Cracks in bent grass or leaves: an indication of the age of a track may be gained by the state of dryness of such cracks:
  - When fresh they are green, but after a few days they turn a brown color.
  - The older the sign is, the darker and dryer the crack is likely to be (see figure 7-32).



Figure 7-32. Cracks in bent grass or leaves

- Breaking and comparing sticks and twigs: A fresh break is a lighter color, and a study of ends normally show fibers protruding:
  - These fibers disappear over a period of time and their color darkens.
  - The fewer fibers are seen and the darker the color of the break the older the sign (see figure 7-33).



Figure 7-33. Comparing by breaking a twig

Comparison of Impression

7-70. The state of dryness of a track in mud or soft ground must be noted. If the track is very fresh, water does not run back into the print or depression made by the target's foot. Later the water runs back and later the mud that has been pushed up around the print and kicked forward begins to dry. By comparing the print beside that of the target's and then considering the color change and the degree of regularity an assessment of the signs age can be made (see figure 7-34 on page 90).



Figure 7-34. Comparing with impression with the old sign

Bracketing

7-71. This method is based on knowing the weather conditions and the amount of wildlife movement typical in the area during the approximate period since the track was laid as follows:

- Weather: by considering the recent weather conditions it is possible to bracket the period when the sign was left for example:
  - Time of rain: a period of heavy rain will leave pockmarks on the sign and will cause a loss of definition. Knowing the time of the last rainfall will provide a clue as to the age of the sign, for example if the last rain was 12 hours a go the sign would be over 12 hours old. Likewise, sign with little damage and plenty of definition will indicate that it was made after the last rainfall, for example, less than 12 hours old (see figure 7-35).
  - Overnight dew: where sign has traces of dew over it indicates that the sign was made the previous day.
  - Strong winds: high wind may result in leaves and foliage obscuring the sign. If this is the case and the tracker knows the time of the last heavy winds, this can be a further aid to judging the age sign.



Figure 7-35. Before and after rain print

- Game tracks superimposed: most wild animals lay up during the day and move at night:
  - If human prints on a main game trail have animal tracks superimposed, and these tracks show that the animals have moved in both directions, then human prints are probably at least one night old or older.
  - Where human prints are superimposed on the animal sign then the track is likely to have been made that day.

Local Knowledge of Flora/Fauna

7-72. A detailed knowledge of local flora and fauna can assist the tracker in judging the age of sign.

7-73. The state and position of trodden vegetation must be noted. Various grasses have different degrees of resilience and prior knowledge of the flora's resilience to being crushed, pushed aside, broken, cut, and so forth, may assist in determining age. Only by studying flora present in AOs over a period of time can the tracker become adept with this method.

7-74. By studying and noting the habits of wildlife, with regards to feeding, watering, movement, and so forth, the tracker can use this information to assist in assessing age. Most wild animals feed and move during hours of darkness, but birds that feed on the forest floor, like blackbirds, feed during the day, so any sign disturbed by feeding or moving animals can assist in assessing age. Disturbed or crushed worm casts, spider

webs, and broken ant, or termite trails should all be taken into consideration. Awareness of the natural surroundings aid in judging age.

SUMMARY

7-75. Over a period of time all sign becomes subjected to natural processes which eventually return it to a state where judging its age becomes more of a guess. However, by considering the type of sign, the degree of exposure and the weather, and then by applying the methods to assist in judging age, it is possible for a VT to become adept at making accurate assessments of the sign's age. This allows the VT to become an accurate intelligence-gathering asset.

ELEMENT OF TRACKING 4—INFORMATION GAINED FROM SIGN TRACKING

7-76. For a tracker to make intelligent, accurate and logical assumptions about a target, it is essential that the tracker has a detailed knowledge of the enemy. Commanders at all levels must ensure that the tracker receives a full intelligence brief on the enemy prior to any patrol action. The more the tracker knows, the more the tracker will find out. The target's mission will rarely be known at the beginning of a tracking task and is normally determined by intelligence cells based on the information provided by the tracker and from previous target information. The information required prior to a patrol should come from the following sources:

- Own intelligence cell.
- Previous patrol reports.
- Local population.
- Police and other security forces.

7-77. Intelligence: the tracker should conduct a detailed study of the enemy's background and in particular the tracker should look at the following:

- Enemy traits.
- Enemy doctrine.
- Enemy habitat.

7-78. Traits: these are the attributes distinguishing one target from another. A study of the target's lifestyle provides excellent information for the tracker as follows:

- Attitudes relate to the general moods or emotions of the enemy as certain nationalities display particularly aggressive or emotional attitudes.
- Beliefs refer to the target's primary beliefs and principles:
  - These beliefs are likely to influence the targets' behavior.
  - For example, a fundamentalist enemy will often suffer more hardship than a less motivated enemy.
- Habits refer to the target's tendency or disposition to act in a particular way, for example always resting in the afternoon. These habits become evident to a tracker over a period of time and will normally assist the tracker in the pursuit.
- Mentality relates to how the target is likely to operate. Does the tracker suffer hardship for a prolonged period, for example, live on hard routine, or does the tracker have certain expectations.

- Physique refers to the physical build of the enemy. Knowledge of the enemy's general physique (tall, small, muscular, slim, and so forth) will assist the tracker to identify the target's sign in areas of foul track. It will also assist in determining the presence of foreigners amid a target group, for example, the sign left by a European amid a group of Asians should be distinctive.
- Diet relates to food and drink that the target regularly consumes. An understanding of the target's diet assists the tracker once again in identifying the targets' sign and may well assist the tracker in making assumptions as to the target's routines and future intentions.

7-79. Doctrine: Interlocked with the target's traits, consideration should be given to the target's doctrine, or teaching/thought pattern as follows:

- Customs, Traditions, and Religious Practices: this relates to the target's usual or long-term habitual practices. Customs may differ from target to target, but a common thread amongst groups is likely to be evident. The target's traditions may well affect his daily movement and tactics, for example stopping to bathe daily or centrally feeding. A target's religious beliefs and teachings may even dictate halt times and rest periods.
- Military Practices: a thorough understanding of the target's drills and procedures will assist the tracker on all tasks. A tracker should immediately recognize the type of enemy the tracker is pursuing by the tactics employed and the numbers being tracked.

7-80. Habitat: a tracker should know where the target comes from. A study of the target's natural habitat will assist the tracker in the task by speeding up the ability to interpret information gained. In jungle regions, the target's habitat would normally be one of the following:

- Remote: a target from a remote region is most likely to possess excellent fieldcraft skills and be adept in living off the land, however, tradition and superstitions may well influence him. An enemy from a remote region may be difficult to track as he is more than likely to be able to self-track.
- Rural: a target from a rural area would traditionally be a farmer or peasant. In most cases the target has good fieldcraft skills and will probably be able to travel light and live off the land. The target is also used to hardships which may result in leaving minimal signs.
- Suburban: a target from a suburban area will generally be far less aware of 'fieldcraft' and field skills than a rural counterpart and is usually easier to track.
- Urban: a target from an urban area will undoubtedly possess far fewer fieldcraft skills than a target from a remote or rural area. The urban target is therefore likely to require more luxuries and suffers less hardship than someone from another habitat.

INFORMATION GAINED

7-81. It is difficult for even small groups to move through an environment without leaving sign noticeable to the trained eye. The tracker must be able to gain as much information as possible from any track. A VT, depending on the state of the track, can gain the following information:

- Direction of travel.

- Numbers being tracked.
- Age of the track.
- Speed and load of people being tracked.
- Rations being used.
- Types of weapons carried.
- Tactics employed.
- Habits/routine.
- Sex of target.
- General health.

DIRECTION OF TRAVEL

7-82. From a given length of track, the VT can assess the general direction that the enemy is moving. Based on a good ground and map study the tracker/intelligence cells can begin to identify the following:

- Possible enemy targets.
- Possible locations of enemy camps or resupply points.
- Likely enemy intentions.

7-83. To ascertain the direction of travel a tracker must be able to identify those types of sign that can indicate the direction in which the target is moving. The following are used as direction indicators:

- Use of pointers.
- Transfer from one area to another.
- High grass and fern pushed down in the direction of movement.
- Heel marks or boot prints in favorable situations (indicator paces).

NUMBERS OF BEING TRACKED

7-84. A knowledge of the enemy strength is essential, and the tracker should try to gain this information as a matter of urgency. Determining the following factors may assist the tracker in estimating numbers:

- The number of sleeping areas identified in a patrol base/LUP area.
- The number of resting places at a rest halt.
- Different types of boot patterns (sign pattern).
- Using a heel count in soft ground where boot prints are distinct using one of the following methods:
  - Measure off a distance of 24 inches and count the number of heel marks noting that one human rarely places the feet down twice within 24 inches.
  - 24 inches can be measured from the butt of the SA80 to the end of the hand guard.
  - Measure off one overstretched pace, then count the number of heel marks within that pace and divide by two; this gives an estimate, for example, five heel marks, two, possibly three people.
  - Measure off two normal paces, then count the number of heel marks within the two paces and divide by two; again, estimate five heel marks, two, possibly three people.

AGE OF TRACK

7-85. Knowing the age of sign enables the tracker to ascertain how far ahead of the tracker the target is and enables both the tracker and intelligence cells to determine where the enemy may be when combined with knowledge of the enemy's speed of travel. Indicators to judge the age of sign include:

- The state of surrounding vegetation.
- Impressions in the mud (comparison).
- Obliteration by rain (bracketing).
- Cracks in bent grass or leaves (comparison).
- Game tracks are superimposed.
- Leaves covering tracks (previous days' climatic conditions).

SPEED AND LOAD OF THE TARGET

7-86. Sign that indicates speed, and sign that indicates load, are intricately combined. Knowing the speed and load of the target is essential to the tracker/intelligence cells for numerous reasons (see figure 7-36 on page 96), for example:

- If the direction of travel is known, to gain on the enemy, the track can be isolated by moving at speed off track before picking it back up and continuing task.
- If the plan is to destroy the enemy being tracked, then knowing the speed and direction of travel will assist in determining where to site ambushes on his projected route.
- Soldiers travelling light are likely to need resupply or early extraction—
  - The tracker or intelligence cell must ask how, when and where this may take place.
  - If either can be identified and patrols tasked early enough the likelihood of success against the enemy is significantly increased.

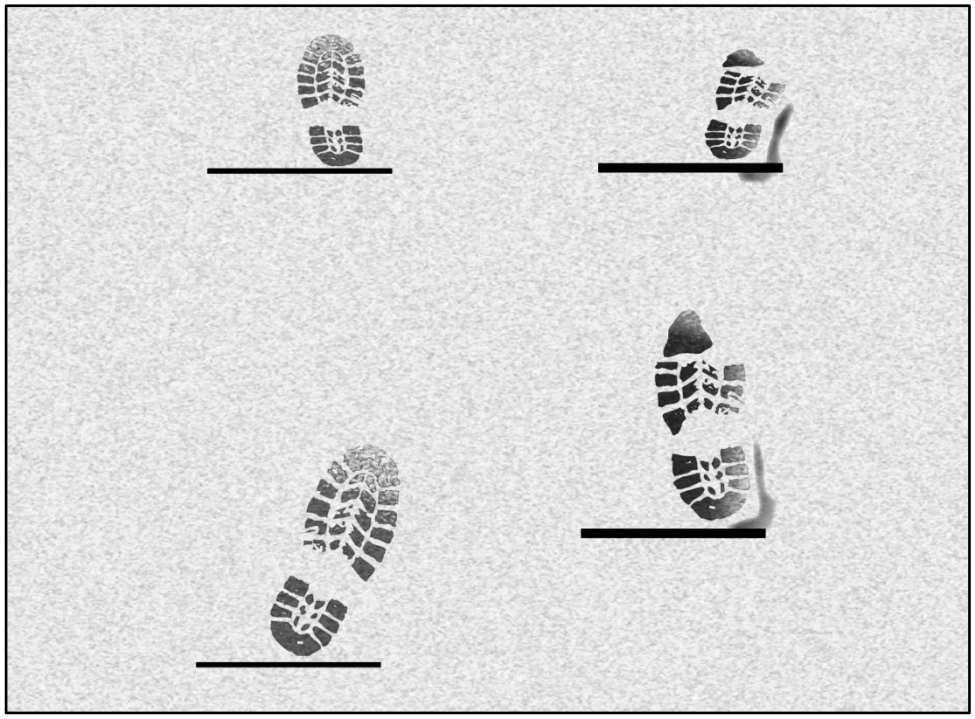


Figure 7-36. Speed and load of the target

7-87. A tracker can estimate the speed and load of the enemy by utilizing the following indicators:

- The distance between rest/LUPs/meal halts will indicate how far the enemy can travel in one day or between meals.
- In soft ground the distance between paces can indicate speed, for example, large stride—fast moving, small stride—slow moving.
- The depth of pace (in comparison to the tracker's) can indicate heavy loads being carried, which means they may be carrying some sort of pack.
- Studying the amount of sign left behind indicates speed, for example, are they taking time to cover it up.
- The route used and obstacles encountered will indicate speed and load:
  - The enemy may go around an obstacle rather than over or through it.
  - Heavy loads, or the enemy may stick to ridgelines indicating a possible requirement to move quickly.
- From the information gained regarding the speed of the enemy, the tracker must ask; is the enemy travelling light and moving fast, or is the enemy moving slowly and why?

RATIONS

7-88. A tracker can gain the following information from discarded rations:

- The nationality of the target if not known:
  - Certain foods may indicate origin.
  - For example, continually finding rice might indicate the target is of Asian origin.
- Who has supplied the rations, for example, are they issued rations or locally supplied rations and if locally supplied, where are the rations coming from?
- Types of rations being used, for example, heavy rations such as tinned food, or lightweight rations such as freeze-dried products. By determining the type of rations used the tracker can ascertain the following:
  - Lightweight rations may cause the enemy to LUP next to water or carry out frequent water resupply drills; the enemy normally needs to cook these rations.
  - Heavy rations might indicate why the enemy are carrying heavy loads and perhaps why his speed is reduced; the enemy might also eat these rations cold and therefore leave less sign, for example, fire marks, and so forth.

TYPES OF WEAPONS

7-89. If the weapons used are not known, identifying the weapons the enemy may be carrying is very difficult and is only possible under favorable conditions. The following can assist the tracker:

- Information from a contact area such as:
  - Discarded ammunition cartridges.
  - Sign located during the initial cast of incident area.
  - From friendly forces in the area of the contact.
- A sighting by a TT.
- Discarded ammo cartridges along the track/or in LUP areas.
- Flannelette located in rest/LUP areas, for example, after cleaning weapons.
- Butt or bipod marks on the ground around rest/LUP/halt areas.
- Sight marks on trees where weapons may have been rested.

TACTICS

7-90. Identifying enemy tactics is a fundamental part of tracking, especially when information reporting. A tracker must therefore determine the tactics employed by the enemy. Knowing the tactics employed not only assist in determining how friendly forces operate against the enemy but assist the tracker in finding information. For example, knowing if the enemy posts sentries while laying up could affect when or how a follow-up force engages the enemy, or knowing that the enemy always travels with flank protection could determine how far from a track ambushes are sited. Likewise, the knowledge that the enemy snap-ambush before halting assists the tracker when determining where to look for information, such as numbers of enemy, and so forth. Assessing the enemy's tactics is done as the track picture is built up through intelligent interpretation of the targets:

- Tactics at halts.
- Tactics at obstacles.

- Tactics at LUP/patrol base areas.
- Deception tactics, if employed.

HABITS/ROUTINES

7-91. A knowledge of the enemy's day-to-day patrol routine is vital to the tracker. After tracking the target for a sustained period idiosyncrasies may be detected which help to identify the patrol, especially if an area of foul track is encountered. The tracker should identify and recognize habits such as:

- The habitual siting of LUPs/patrol base on or near certain topographical features such as streams:
  - Knowing this assists in identifying future enemy locations for either track isolation or follow-up purposes.
  - Such a habit might also indicate the requirement for water for cooking or fishing for food.
- Negotiating obstacles or bypassing thick vegetation in a certain manner or direction. If this can be identified, then ambushes can easily be sited in these locations.
- Carrying out halts or tasks at regular periods assists the tracker in knowing where to look for incidents:
  - This helps the tracker to anticipate enemy actions, for example, meal halt followed by a comms halt, and so forth.
  - This speeds up the tracker's ability to interpret incidents and subsequently spend more time on track.
- Patrol members' idiosyncrasies may also be observed, for example, smokers, twig snapping, and so forth, (sign pattern) which assist in identifying this patrol from other patrols.

DETERMINING ENEMY SEX

7-92. This is less likely to be identified than the other information gained but is detectable by the following means:

- Enemy forces with female soldiers normally have separate sleeping areas and toilet areas, particularly those who have stricter moral codes, for example, as was the case with the Vietcong and Malay Communist Terrorists.
- Females urinate squatting thus leaving a deeper depression in the earth between the feet than a standing male.
- Evidence may be found of the debris associated with female monthly periods.
- Females tend to have more neutral pitch angle.

GENERAL HEALTH

7-93. The target's general health can sometimes be detected by some of the following methods:

- Examination of toilet areas and feces, for example, diarrhea or dysentery.
- Vomit or bloody sputum indicates ill health.
- Blood-stained bandages or other medical debris indicate injury or ill health.

SUMMARY

7-94. The TT should always be on the lookout for information. It is essential that the patrol receives a full intelligence brief prior to the action, and they should report any information considered vital immediately. Each day a radio report is sent including a summary of the information gained, and at the end of the patrol action the patrol should be fully debriefed and complete a full patrol report. Interpretation of the facts gained starts with the TT on the ground. However, intelligence cells must conduct their own close examination of the intelligence provided to ensure that vital information is not missed.

SECTION IV – TRACKING TECHNIQUES AND PROCEDURES

7-95. This section explains the tracking team's tasks and goes into detail on the importance of the reporting procedures to create actionable information.

TACTICAL TRACKING

7-96. The drills and procedures listed in this section should be applied in conjunction with the basic principles of patrolling and the routine drills contained in Infantry tactical doctrine. This section is designed to illustrate how a TT conducts its routine patrolling and how it conducts a pursuit. When employed on an information reporting task, the TT works purely under the command of the team commander. However, it is when the team is employed in the pursuit role, attached to a follow-up force that a greater understanding by commanders of tracking techniques is required.

TRACKER TEAM COMPOSITION

7-97. In general terms, any TT can conduct either information reporting or pursuit tasks. Usually, a team tasked to conduct an information reporting patrol will consist of VTs. The addition of a tracker dog will assist the VTs especially in urban areas. While for a pursuit a tracker dog is attached to the team. Anything other than this will reduce the TT's efficiency. A TT consists of three elements: the command, the tracker, and the protection element.

ORGANIZATION

7-98. The ideal TT is organized and responsibilities allocated as follows:

- The command element consists of the team commander and a radiotelephone operator who is not required to be tracker trained.
- The tracking element consists of two VTs:
  - The first VT is employed as the lead scout (see lead scout duties section).
  - On occasions the tracking element includes one or two tracker dogs and handlers, with one or both VTs acting as CM for the dog and handler.
- The protection element consists of:
  - Two additional VTs who will relieve the tracking element as and when required.
  - If fully trained VTs are not available, then riflemen who are used to operating as lead scouts may be used.

CAPABILITIES AND LIMITATIONS OF A TRACKER TEAM

7-99. In general terms, a TT has the following capabilities.

- Deployment: the team inclusive of a dog can be deployed by any means including helicopter abseil.
- Duration: the team can ideally carry food and equipment to operate for up to 5 to 6 days. Any increase in duration without resupply adds weight and slows down the follow-up. Providing the team can be re-supplied they can continue to operate indefinitely.
- Age of track: when tasking a VT, sign up to 72-hours old should be used as a planning figure. This time varies depending upon conditions. For a tracker dog 24 hours is a good planning figure although up to 72 hours is not beyond a dog's capabilities in favorable conditions.
- Communications: the team must be capable of communicating on both very high frequency (VHF) and HF nets.
- Intelligence: the team can locate, identify and pursue sign and from intelligent interpretation of the facts pass on information to commanders.
- Reporting: the team can report the information it has gained by either radio, patrol report, hot debrief or presentation depending on the requirements of the commander.
- Pursuit: the team can pursue sign following either a contact or sitting to gain or maintain contact as required by the commander.

7-100. In general terms, a TT has the following limitations:

- Night: the team is unable to track at night through close country in a tactical manner.
- Weather: rain and weather extremes degrade the sign/scent left by the enemy and slows trackers down.
- Contact: TT is vulnerable to contact when tracking an enemy who is tracker aware.
- Time: a track that is more than 24-hours old slows the pursuit.
- Foul track: in areas used frequently for patrol or civilian movement enemy sign is difficult to identify due to tracks being overused.

LEAD SCOUT DUTIES

7-101. One of the most physically and mentally demanding tasks in the jungle environment is that of the lead scout, because as an individual, both the lead scout's personal patrol skills and powers of observation must be of the highest caliber. While tracking an enemy the likelihood of contact is greatly increased because at any time the TT may encounter the enemy they have been tracking. Due to the restricted visibility in close country, encounters with the enemy can happen at very close quarters with little or no warning.

7-102. Acting as a lead scout goes together with being a VT as the VT not only tracks the enemy but has the added burden of acting as the lead scout for the team. The VT is supported by the CM. They must work in unison with the CM protecting the VT at the appropriate times so that the VT can conduct the track pursuit drill if the team is to maintain its security. There are many occasions when a VT will act as a lead scout but

will not necessarily be tracked, for example when patrolling to a cast site, or when patrolling to an LUP.

Considerations

7-103. Equipment: due to the taxing nature of being a lead scout and the requirement for heightened senses, the equipment/load needs to be kept to a minimum. The lead scout should not be carrying any team equipment such as the radio, medical kit, or any support weapons.

7-104. Position and spacing of the lead scout: the scout is the eyes and ears of the team and 90 percent of the time a contact is going to come from the front, unless a well-laid ambush is encountered. Therefore, the scout's position and spacing is critical; it goes without saying that the scout is going to be the first person in the team. However, spacing is the responsibility of the second person. Normally this spacing is slightly greater than that of the remainder of the team, enabling the scout to use the senses fully. However, when tracking, at times the CM must move further forward to provide security for the VT. This difference is only marginal, and the CM is constantly adjusting the distance depending on the visibility.

7-105. Rotation of the lead scout: the lead scout can very rapidly become mentally and physically exhausted due to the nature of the task. Commanders need to recognize this fact and consequently rotate the lead scout on a regular basis.

Summary

7-106. During the Malaya Emergency and Borneo Confrontation most friendly force casualties were lead scouts. Fortunately, these were relatively low due to the relentless training carried out by British forces. The soldiers involved trained to a point of being intimate with their weapons, being able to detect a stoppage by sound or feel alone. This is the level that all Infantry Soldiers operating in a jungle or close country environment need to achieve. A good lead scout should be able to move silently and communicate with the minimum fuss with the team and detect any presence, be it friendly or foe, without first being seen. Through hard, dedicated, and realistic training all Infantry Soldiers should be able to attain this standard.

TRACKER TEAM ROUTINE DRILLS

7-107. The movement of the VT element is very slow, and all team members must maintain high levels of alertness for long periods of time. On occasions, for example, when in pursuit, the TT would be supported by a section or platoon from a rifle company. Their main task while on the move would be to provide immediate support then take over from the TT when contact is made. The TT should always seek the safety of a larger friendly force where possible when laying up.

Team Movement

7-108. The team moves cautiously and deliberately, covering all arcs as they move. The speed at which they move can be slow dependent on the skill and experience of the VT and the amount of sign created by the target. A well trained and disciplined target will leave little sign and may use deception tactics or select a route over terrain which is not

conducive to leaving good sign. The target may also place snap ambushes and booby traps en route and may move along topographical features, such as ridgelines, where sign is more difficult to follow but the tracks are generally easier to site ambushes. The VT and tracking team commander must strike a balance between the requirement to gain on or maintain pace with the enemy, and the requirements for stealth and security. The rate of advance also varies depending on the terrain and conditions encountered.

7-109. The TT generally moves in a single file to allow the VT to carry out the drills without being foul tracked by other team members. The VT and CM will track, the other team members are to stay in visual range, with the team commander being the link person, and everyone remaining alert. When necessary, the remainder of the team closes to provide protection for the VT and CM (see figure 7-37).

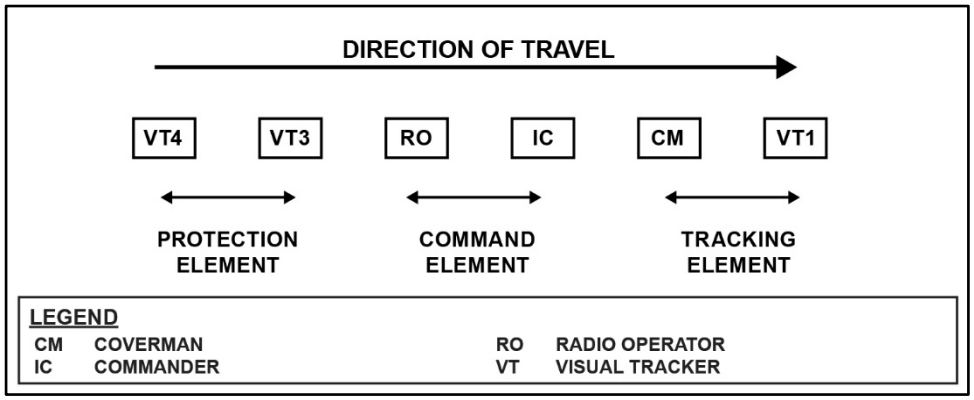


Figure 7-37. Tracker team order of march

7-110. The order of march will frequently change within the team due to the rotation of the lead scout/VT. The order of march (see figure 7-37) will be the tracking element (VT followed by the CM), the command element (team commander and radiotelephone operator), then the protection element (the next pair of VTs). The CM determines the distance between the lead scout and the CM. VTs will be rotated as required. When attached, the dog and handler, when not tracking, are located within the command element.

Routine Drills

7-111. The TT is extremely vulnerable while conducting an obstacle crossing, especially in open areas or places that are dominated by high ground. If the enemy is aware that they are being tracked, they may leave an ambush party to defeat the TT. An obstacle is an ideal ambush site because the team may well be exposed at this point. To cross an obstacle, the TT will utilize the caterpillar method as this enables the VT to remain on sign and prevent it from being fouled by other members. The drill is as follows:

- VT1 indicates the obstacle and the remainder of the team goes firm and conducts a listening halt. The VT and CM then track forward to the entry point and cover the obstacle.

- The maneuver commander and RM move up to the VT and CM and relieve them by covering up and down the obstacle while VT3 and VT4 cover the rear. The team commander can control the crossing from a central position.
- The VT and CM track the sign across the obstacle ensuring that they confirm the exit point. They then move, remaining on sign, to the limit of visibility on the far side of the obstacle and then go firm.
- VT3 and VT4 then move forward and relieve the maneuver commander and RM who subsequently cross the obstacle. On reaching the exit point they go firm and cover up and down the obstacle.
- Finally, VT3 and VT4 cross the obstacle and rejoin the team. Once complete the commander gives the order to continue tracking.

7-112. The tactical halt drill is conducted as described in chapter 4:

- The VT marks the last definite sign and back-tracks several meters before breaking track.
- On completion of the halt, the team moves to an LUP or back to the last definite sign to continue on track if the light conditions allow.

7-113. The TT should remain on sign for as long as possible. This is normally from the point after first light when the sign can be identified, up until the point when light has faded and sign can no longer be distinguished. Timings for when sign can be read cannot be dictated and will vary depending upon the terrain, weather and the ability of the VT. It stands to reason that the TT may have to occupy an LUP sometime before the last light and cannot commence tracking until sometime after the first light. The LUP or overnight halt should follow after the meal/communications halt.

Change Over Procedure

7-114. The VT cannot track indefinitely and must not track when tired. There is no hard and fast rule as to when the VT must hand over and sometimes handing over may be tactically unsound, for example, on arrival at an incident site, or if the VT is still fresh. Flexibility therefore is required. It is essential that when the VT hands over to another VT that the track is not lost, and that security is maintained. In simple terms, the VT will hand over to the CM then become VT4, VT3 will take over as CM and VT4 will move forward one place to become VT3. It is not recommended to swap the VTs in pairs because even though both are fresh, neither will be tuned in or will be fully aware of the track picture.

7-115. When the VT states that a rest is needed or is told to change over by the team commander, the VT will go firm, and the CM will close up. The team commander will cover them. The VT briefs the CM as follows:

- The VT shows the CM the sign the VT is on, which should be conclusive, and indicates the furthest sign.
- The VT informs the CM of what key sign the VT has been following.
- The VT updates the CM on the track picture, for example, any information that the new VT may not be aware of, anticipated incidents, and so forth.

7-116. The CM then tunes in and observes the sign. If the CM is content that the VT is on conclusive sign the CM will take over. However, if CM is not content, the VT recommences on track until the next conclusive sign, where the procedure is repeated

until the CM is confident that the VT is on track. The VT reconfirms all the information that was previously briefed to the CM on and steps off track. The CM tunes in and is now ready to continue as the VT. It is important in maintaining patrol security that the CM continues the duties until ready to take over as the VT.

7-117. The VT3 moves forward ahead of the team commander to cover the new VT while VT3 tunes in. The VT3 will be fully briefed by either the team commander or the old VT. The VT3 then continues on task until it is time to become the VT.

7-118. The original VT becomes the last person and VT4 will step up one place. This ensures that each VT has an equal amount of rest and that the task of being the CM is spread equally amongst the VTs, and that the CM is always fresh.

7-119. Tracking is an extremely difficult task, especially when near the enemy. It can be very slow and tiring and it is vital that the team carries out these drills proficiently as this ensures that their security is maintained.

KIT AND EQUIPMENT

7-120. The TT should travel as lightly as possible; however, the team commander must ensure that the team has all the equipment required for the team action. The team should carry all the equipment normally carried for the environment they are operating in. Depending on the tactical situation, especially during pursuit tracking, it may be advisable to employ a light machine gun in the team.

TRACKING REPORTS

7-121. For trackers to fulfil their potential as an intelligence gathering asset the information gained by a TT must be reported, collated and acted upon in a timely and efficient manner. On tasking any TT, they must be given a mission stating clearly a desired end state, for example, to gather information on the enemy to conduct subsequent offensive operations against them. Subsequent offensive operations based upon the information provided by trackers will normally be in the form of either an ambush or a deliberate attack. Ambushes will be set on enemy routes and cache locations and attacks will be mounted against enemy camps. The success of any follow-up action will be affected greatly by the intelligence upon which it is planned.

SIGNALS REPORTS

7-122. The ability to communicate by radio is crucial to a TT. Radio communications enable the team to relay information without returning to a friendly force, and to call support whenever they need it. The TT normally uses location schedules sending a situation report twice per day. Other urgent information must be passed without delay. The team signaler must be proficient at both HF and VHF communications.

TRACKING REPORT

7-123. The signal's tracking report is used at the cast site or when sign is first located and should also be used to send any other information as and when required for example, as a daily situation report or critical information gained on track. Not all the serials have to be sent, especially if the serial contains information that has already been sent or where there is no change. Alternatively, "No Change" may be sent during difficult

communications, which keeps the report running in sequence. The information sent is a summary of the information gained. This is referred to as the LNDATA report. If available, the following information is sent:

- Location.
- Number of personnel.
- Direction the quarry is moving.
- Age of the track.
- Type of track.
- Additional information.

7-124. The signals reports must be sent at the correct times so that the intelligence can be collated as it becomes available. The team sends a tracking report on initially locating sign and then in accordance to the allotted radio schedules.

HOT DEBRIEF

7-125. The hot debrief is utilized on the completion of a patrol as a means of reporting the main information gained. For a TT the hot debrief is normally delivered to the team's platoon commander, leadership, an intelligence officer, operations officer or if attached to a company the company commander. Before the hot debrief, the team commander debriefs the team and collates all the relevant information. The hot debrief should be conducted no later than 1 hour after the team returns, and the commander must ensure the passing of key information. If possible, the complete team should be present during the debriefing.

VISUAL TRACKING REPORT

7-126. The signals reports and the hot debrief are fundamental in reporting the information gained from the track. However, this information is often collected by more than one agency. The hot debrief is probably not written down and recorded except in the patrol notebook. This information over a period of time may become mislaid and intelligence will be lost. The visual tracking report is the primary means for recording information. When produced the final product will include a full record of the information gained on the enemy. Furthermore, the visual tracking report is archived and recorded as part of the overall operational intelligence picture and can be used to inform planners of future operations.

SECTION V – COUNTERTRACKING AND ANTITRACKING

7-127. Antitracking refers to deceptive techniques used to disguise one's own tracks or to fool the tracker. The following techniques may be helpful to increase the time-distance gap or to momentarily confuse pursuing parties. However, a well-trained tracker will always overcome one's efforts. Antitracking techniques include:

- Walking backwards to mislead the direction of travel; normally employed when the ground is soft and footprints are easily visible.
- Brushing track to leave minimal sign; for example, covering up leaves along the route or washing off mud after a river crossing. Commonly employed in track traps.

- Stone hopping to avoid footprints. After a stone has lain for some time, a wall of dirt and sand will build up around its base. If stepped on, this wall will crumble and appear as a gap between the stone and the surrounding ground.
- Crossing or walking in a stream.
- Fading out, where personnel are left behind or trail behind the main body to create misleading intervals between signs.
- Splitting up into smaller groups or into individuals and heading to a rally point. Referred to as the star method.
- Counter tracking refers to offensive techniques employed to harm the pursuing tracker.

7-128. Countertracking techniques include:

- Booby traps or improvised explosive devices:
  - Modern examples include tripwires and pitfalls.
  - Historical examples include punji sticks and bamboo whips.
- Ambush.

Chapter 8

Fire Support

Timely and accurate fire support is often decisive in overcoming enemy resistance and achieving mission success, particularly when operating in challenging terrain. This chapter details the procedures for requesting and coordinating indirect fire, encompassing mortars, artillery, and close air support (CAS). The chapter covers the essential elements of a call for fire (CFF), as well as the capabilities and limitations of each fire support asset. Effective integration of fire support maximizes combat power and minimizes risk to friendly forces.

SECTION I – CALL FOR FIRE

8-1. CFF is an important skill to master in the jungle environment. The jungle environment has multiple negative effects on the CFF process. It is important to understand these considerations to master the skill in the jungle environment.

8-2. Obscured target acquisition includes the following:

- Limited line of sight: dense vegetation severely restricts visual observation.
- Camouflage and concealment: the enemy effectively blends into the jungle, making them harder to spot.

8-3. Inaccurate target location includes the following:

- Difficult terrain: uneven terrain and dense canopy can lead to errors in estimating target distance and direction.
- GPS limitations: jungle canopy can degrade GPS signals, affecting accuracy.

8-4. Communication barriers include the following:

- Terrain interference: jungle foliage can disrupt radio transmissions, leading to broken or unclear communication.
- Atmospheric conditions: high humidity and weather can further impact signal quality.

SECTION II – MORTARS

8-5. Mortars provide crucial indirect fire support in jungle warfare, capable of engaging enemy positions obscured by dense vegetation where direct fire weapons are ineffective. This section details key considerations for employing mortars effectively and safely in jungle operations. By mastering these considerations, mortar crews can leverage the unique capabilities of their weapons system to provide decisive fire support and dominate the jungle battlefield.

ADVANTAGES OF MORTARS IN THE JUNGLE

8-6. High trajectory: ideal for engaging targets in defilades, behind reverse slopes, and under dense canopy where flat trajectory weapons struggle.

8-7. Rapid deployment/displacement: relatively lightweight and mobile, allowing for quick emplacement and repositioning in challenging terrain.

8-8. Variety of ammunition: access to high-explosive, illumination, smoke, and (potentially) precision-guided rounds for diverse mission sets.

JUNGLE-SPECIFIC CHALLENGES

8-9. Target acquisition: dense foliage hinders observation, demanding reliance on sound, movement detection, patrols, and technology (thermal, radar) for target information.

8-10. Inaccurate target location: uneven terrain and canopy disrupt line of sight, potentially affecting accuracy. Polar coordinates may be more reliable than grids.

8-11. Ammunition resupply: difficult terrain and enemy activity can complicate resupply efforts. Careful planning and potential use of airdrops are vital.

8-12. Environmental factors: high humidity and temperature can impact propellant performance. Consistent ammunition storage and care are essential.

EMPLOYMENT CONSIDERATIONS

8-13. Employment of mortars in the jungle is like other AOs; however, it can be more difficult to find a suitable location:

- Positioning:
  - Seek elevated positions for improved observation but prioritize concealment to avoid counter-battery fire.
  - Utilize natural cover and camouflage effectively.
- Fire direction:
  - Train crews on using aiming points and adjusting fire based on limited visibility.
  - Emphasize communication with forward observers (FOs) for accurate target data and battle damage assessment.
- Ammunition selection:
  - High-explosive rounds are versatile but consider airburst options for greater effectiveness against targets under canopy.
  - Smoke rounds can provide cover or obscure enemy OPs.
  - Illumination is crucial for nighttime operations but is used judiciously to avoid enemy targeting.
- Coordination:
  - Maintain close coordination with maneuver units to avoid fratricide.
  - Establish clear fire support coordination measures to delineate safe fire zones.

TACTICS AND TECHNIQUES

8-14. Pre-planned fires: register likely enemy positions and areas during planning for rapid engagement.

8-15. Sound ranging: train crews to utilize sound to estimate enemy mortar or artillery positions for counterfire.

8-16. Patrolling for target acquisition: deploy mortar observers with patrols to enhance target detection and location.

8-17. Close integration with FOs: ensure observers are equipped and trained to direct mortar fire effectively in jungle conditions.

SAFETY AND RISK MITIGATION

8-18. Positive target identification: emphasize strict adherence to rules of engagement and positive identification to prevent fratricide.

8-19. Minimum safe distances: adjust minimum safe distances based on jungle terrain and potential for reduced visibility.

8-20. Ammunition handling: enforce proper handling procedures to prevent accidental detonation in hot, humid environments.

TRAINING EMPHASIS

8-21. Jungle terrain familiarization: conduct exercises in dense terrain to acclimate crews to the environment's impact on mortar operations.

8-22. Limited visibility fire missions: train extensively on engaging targets with limited or no visual contact, relying on sound, observer reports, and technology.

8-23. Communications drills: practice establishing and maintaining reliable communications in challenging jungle conditions.

8-24. Emergency resupply procedures: rehearse airdrop procedures and alternate resupply methods to ensure continuous fire support.

SECTION III – ARTILLERY

8-25. The jungle, with its dense foliage, unforgiving terrain, and unpredictable conditions, presents a unique set of challenges for artillery employment. While the raw power of artillery remains a tempting force multiplier, its use in this environment demands a nuanced understanding of its limitations and a commitment to meticulous planning and coordination.

8-26. This section delves into the complexities of utilizing artillery in jungle operations, highlighting both the potential benefits and inherent risks. This section explores how factors like limited visibility, communication constraints, and environmental considerations necessitate adaptations in TTP. By understanding these intricacies, commanders can make informed decisions about when and how to leverage artillery effectively while mitigating the potential for unintended consequences in this unforgiving battlespace.

ADVANTAGES OF ARTILLERY IN THE JUNGLE

8-27. Reach and firepower include the following:

- Extended range: artillery can strike deep within enemy territory, even when terrain restricts ground movement. This is crucial for disrupting enemy operations, targeting supply lines, and neutralizing high-value assets.

- Heavy punch: artillery delivers a significant weight of fire, capable of neutralizing enemy formations, destroying fortifications, and suppressing enemy defenses.

8-28. Psychological impact includes the following:

- Demoralizing effect: the thunderous barrage of artillery has a powerful psychological effect on enemy morale, potentially weakening their resolve.
- Force multiplier: even when direct hits are limited by canopy, the impact of artillery can disrupt enemy movements, delay attacks, and force them to disperse, creating opportunities for friendly forces.

8-29. Area denial and interdiction include the following:

- Denying key terrain: artillery can make movement through specific areas hazardous for the enemy, denying them access to vital terrain or avenues of approach.
- Interdicting supply lines: strikes on enemy logistics routes and rear areas can disrupt their flow of supplies, ammunition, and reinforcements.

8-30. Specialized munitions include the following:

- Improved conventional munitions: rounds with airburst capabilities or enhanced fragmentation effects can be effective against targets under canopy.
- Smoke and illumination: artillery can deliver smoke screens to conceal friendly movement or illuminate enemy positions during night operations.

8-31. Important considerations include the following:

- Limited visibility and accuracy: dense jungle canopy can severely hinder target acquisition and impact the accuracy of artillery fire.
- Collateral damage concerns: the risk of unintended damage to civilian structures or friendly forces is heightened in dense, often poorly mapped jungle environments.
- Logistical challenges: transporting ammunition and emplacing artillery in difficult terrain can be a significant logistical burden.

8-32. While artillery possesses inherent advantages in jungle warfare, its effective employment hinges on overcoming significant challenges. Commanders must carefully weigh the benefits against the risks, ensuring that artillery fire is employed judiciously and in a manner that maximizes its impact while minimizing unintended consequences.

CHALLENGES OF ARTILLERY IN THE JUNGLE

8-33. Target acquisition and accuracy:

- Obscured line of sight: dense jungle canopy severely limits visual observation of targets, making it difficult for FOs to acquire and locate enemy positions accurately.
- Inaccurate target location: uneven terrain, dense foliage, and potential GPS signal degradation can lead to errors in target location, increasing the risk of inaccurate fire missions.
- Limited target information: the enemy’s use of camouflage and concealment in the jungle can make it difficult to determine the size, composition, and

disposition of enemy forces, impacting the selection of appropriate munitions and fire support plans.

8-34. Environmental factors include:

- Weather impacts: high humidity, heavy rainfall, and low cloud cover can affect propellant performance, reduce visibility for observers and aircraft (if used for target acquisition), and restrict access to firing positions.
- Jungle canopy effects: the dense canopy can deflect or prematurely detonate projectiles, reducing their effectiveness. Airburst munitions may be required to overcome this challenge.

8-35. Communication challenges:

- Terrain interference: jungle foliage, hills, and ravines can disrupt radio communication between FOs, fire support teams, and artillery units, leading to delays, miscommunication, and inaccurate fire missions.
- Limited communications infrastructure: establishing and maintaining reliable communication networks in dense jungle environments can be logistically challenging.

8-36. Logistical constraints:

- Difficult terrain: transporting heavy artillery pieces, ammunition, and support equipment through dense jungle can be slow, laborious, and vulnerable to enemy ambushes.
- Limited emplacement options: finding suitable firing positions with adequate cover, concealment, and space for gun maneuvering can be challenging in restrictive jungle terrain.

8-37. Collateral damage concerns:

- Densely populated areas: jungles often have nearby villages or settlements, increasing the risk of civilian casualties from inaccurate fire or stray rounds.
- Poorly mapped terrain: the lack of accurate maps and intelligence on the location of civilian structures further complicates efforts to avoid collateral damage.

EMPLOYMENT CONSIDERATIONS

8-38. Employment for artillery in the jungle is like other AOs but there are some specifics to the jungle terrain that need to be considered.

PLANNING AND PREPARATION

8-39. Detailed terrain analysis: conduct thorough terrain analysis using maps, imagery, and patrols to identify:

- Suitable firing positions: consider concealment, accessibility, space for gun maneuvering, and potential for counter-battery fire.
- Observation points: locate positions with the best possible line of sight, even if limited, for FOs.
- Likely enemy positions: analyze terrain to predict enemy avenues of approach, defensive positions, and potential ambush sites.

8-40. Intelligence gathering: prioritize intelligence collection on:

- Enemy disposition and strength: information on enemy units, equipment, and fortifications is vital for effective targeting.
- Civilian presence: determine the location of villages, settlements, and religious sites to mitigate collateral damage.
- Weather patterns: understand prevailing weather conditions and their potential impact on visibility, communications, and fire missions.

8-41. Fire support coordination:

- Establish clear fire support coordination measures: define restrictive fire support coordination measures, such as coordinated fire lines and restricted fire areas, to prevent fratricide in the confusing jungle environment.
- Close coordination with maneuver units: maintain constant communication with maneuver units to ensure artillery fire supports their operations without endangering friendly forces.

TARGET ACQUISITION AND ENGAGEMENT

8-42. Aggressive reconnaissance: utilize patrols, scouts, and FOs to aggressively seek out enemy positions and provide accurate target information.

8-43. Alternative observation methods:

- Sound and movement detection: train observers to identify enemy activity by sound (weapons fire, vehicle movement) and subtle movement cues.
- Deploy unmanned aerial vehicles, when available, to provide an aerial perspective for target acquisition and battle damage assessment.

8-44. Precision-guided munitions: when feasible, employ precision-guided munitions to enhance accuracy and minimize collateral damage, especially in areas with limited visibility or a risk of civilian presence.

LOGISTICAL CONSIDERATIONS

8-45. Streamlined logistics: develop efficient procedures for transporting artillery pieces, ammunition, and supplies through challenging terrain.

8-46. Ammunition management: carefully manage ammunition stockpiles, prioritizing types most effective in the jungle (airburst, enhanced fragmentation).

8-47. Alternative positioning: consider using helicopters or airdrops to emplace artillery in remote or inaccessible locations, if available.

SAFETY AND RISK MITIGATION

8-48. Stringent rules of engagement: enforce strict adherence to rules of engagement and positive target identification protocols to prevent fratricide.

8-49. Collateral damage estimation: conduct thorough collateral damage estimations before each fire mission, considering potential impact on civilian structures and the environment.

8-50. Minimum safe distances: adjust minimum safe distances based on jungle terrain and the potential for reduced visibility and inaccurate target location.

SECTION IV – CLOSE AIR SUPPORT

8-51. CAS can deliver decisive firepower in jungle operations, but its employment presents unique challenges. This section outlines key considerations for effectively and safely integrating CAS in the jungle environment. CAS can provide significant firepower but requires careful coordination and clear target marking. Emphasize the importance of trained joint terminal attack controllers and the use of laser designators. Weather in the jungle will affect the ability to CAS and its utilization on the battlefield. By understanding these considerations and employing CAS judiciously, commanders can unleash its devastating firepower while mitigating risks and maximizing its effectiveness in the challenging jungle environment.

ADVANTAGES OF CLOSE AIR SUPPORT IN THE JUNGLE

8-52. Overcoming terrain obstacles: aircraft can bypass dense vegetation, rivers, and rugged terrain that impede ground movement.

8-53. Rapid response: CAS assets can quickly reach targets across the battlefield, providing timely fire support to maneuver units in contact.

8-54. Psychological impact: the sight and sound of airpower can demoralize enemy forces and bolster friendly morale.

JUNGLE-SPECIFIC CHALLENGES

8-55. Target acquisition and identification: dense canopy obscures enemy positions, demanding creative use of technology, intelligence, and ground observation.

8-56. Limited visibility for pilots: foliage, weather, and terrain can hinder pilot visibility, increasing the risk of inaccurate strikes or fratricide.

8-57. Communication constraints: jungle canopy and terrain can disrupt radio communication, complicating coordination between ground forces and aircraft.

8-58. Environmental considerations: weather patterns, such as low cloud cover and heavy rain, can severely restrict CAS availability and effectiveness.

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Chapter 9

Jungle Mobility

Navigating and maneuvering through dense jungle terrain presents unique challenges that demand specialized planning and techniques. This chapter details the considerations for successful jungle mobility, encompassing both individual and unit movement. This chapter explores essential equipment, dismounted movement techniques, rope system installation, and various insertion/extraction methods. Mastery of these skills is critical for maintaining operational tempo and achieving objectives within a complex environment.

SECTION I – PLANNING

9-1. All classes of terrain are common in the jungle, but the prevalence of more intense Classes III to V terrain can vary based on the geographical region in which the CCTE is located. Steep Classes III to V terrain can be a result of water erosion over time or a result of the formation of the land mass such as the case in some Pacific Island chains. Paragraphs 9-2 to 9-6 are the classifications of terrain to be considered when planning a route.

CLASSES OF TERRAIN

9-2. Class 1 terrain is identified as gentle slopes or easy trails. This terrain is negotiated with simple walking techniques. Class 1 terrain is considered easy terrain.

9-3. Class 2 terrain involves off-trail scrambling in steeper, more rugged terrain. Use of hands may be needed to negotiate Class 2 terrain, but generally the likelihood and consequence of a fall is low. Good physical conditioning is required, but no technical solutions are needed for safe movement. Moving a casualty will generally require technical systems. Class 2 terrain is considered easy terrain.

9-4. Class 3 terrain usually necessitates moderate scrambling, with the use of hands needed for balance. Movement may be easy, but death or serious injury may be the consequence of a fall. Experienced mountaineers will usually travel un-roped. Use of fixed ropes or belay techniques may be required for beginners to cross sections with greater exposure or when heavy rain and muddy surfaces are present in the jungle. Class 3 terrain is considered moderate terrain.

9-5. Class 4 terrain is steeper terrain that involves belayed climbing or fixed ropes. There is moderate to difficult scrambling which may have some exposure. Serious injury or death can occur if an un-roped fall occurs. Basic mountaineers are needed to negotiate this terrain, with assault climbers finding the route, fixing the rope, and providing belays where necessary. It requires significant time and resources to manage risk for large elements and is more efficiently traveled by small teams. Class 4 terrain is the most difficult terrain to evaluate and manage risk. Class 4 terrain can be considered moderate to hard depending on the exposure and consequence of a fall. Common examples of

Class 4 terrain in the CCTE are steep draws or spurs, likely covered by ferns or vegetation which mask the ground shape, and steep terrain bordering waterways.

9-6. Class 5 terrain is vertical terrain always involving hands and feet while moving. This terrain is complex, dangerous ground where significant injury or death can occur from an un-roped fall. Class 5 terrain requires Soldiers to be roped up, use belay techniques, and place intermediate protection. Assault climbers are required to negotiate this terrain. Assault climbers may be able to travel 1:1 with basic mountaineers, if time is given for rehearsals prior to an operation, but generally only assault climbers will be climbing in Class 5 terrain. Class 5 terrain is considered hard terrain when planning (see figure 9-1). Examples of Class 5 terrain in a CCTE are waterfalls, terrain off ridgelines, canyons, and cliffs.

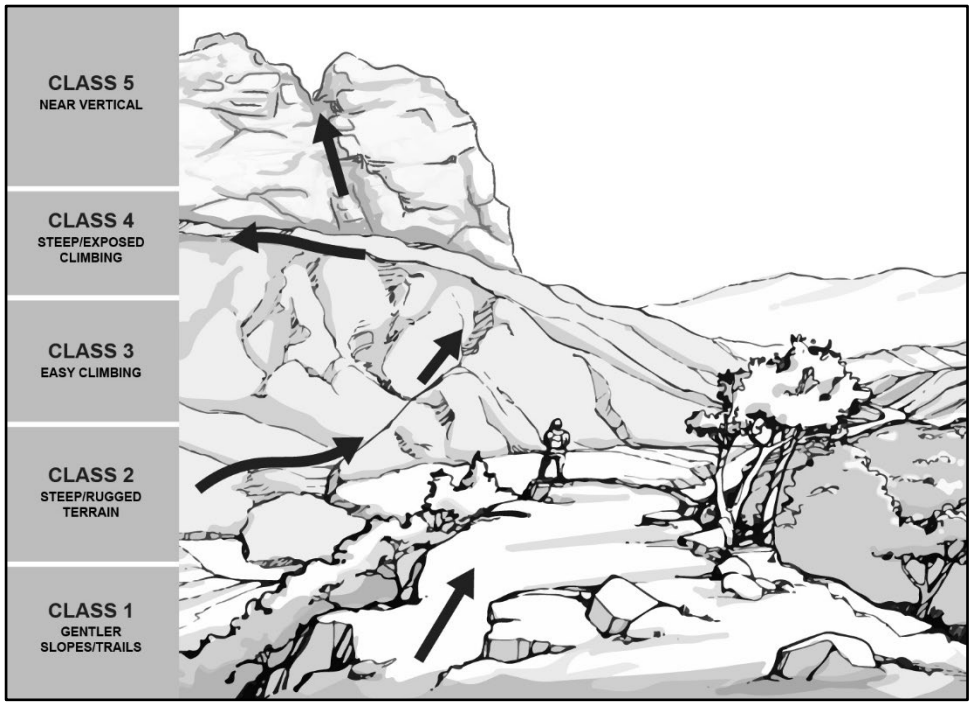


Figure 9-1. Classes of terrain

PLANNING CONSIDERATIONS

9-7. The use of rope based dismounted mobility should be trained and rehearsed prior to implementation on an operation. A variety of methods exist that vary on difficulty and time required. The following should be considered when planning a route and deciding on techniques:

- Likelihood of enemy contact and time required.
- Risk from fall and risk from compromise.
- Equipment available.
- Level of training and fitness of Soldiers.

9-8. Other considerations/TTPs for the CCTE include the following:

- Ferns and vegetation regularly mask the ground underneath, hiding steep drops.
- Dense vegetation in vicinity of vertical or near vertical terrain may require different rope systems than normally used in a high-altitude environment.
- Simple mobility aids may be effective for navigating moderate terrain.
- Muddy/slippery ground can effectively upgrade the classification of terrain.
- Consider what equipment is left behind if dealing with enemy tracking or counter tracking teams.

9-9. It is important to understand what constitutes a good anchor point for use in mobility operations. This rule is "5, 5, Alive," all anchor points should be at least 5-feet tall, 5 feet in diameter, and a currently living tree.

SECTION II – EQUIPMENT

9-10. Specific mobility equipment carried on a mission is dependent on METT-TC (I), however, the following is a recommendation for a basic kit that should be carried by all members of the squad (see figure 9-2):

- 1 x 30 feet, 1-inch tubular nylon webbing.
- 2 x locking carabiner.
- 1 x 5 feet, 7-mm accessory cord.
- 1 x air traffic control or belay device.

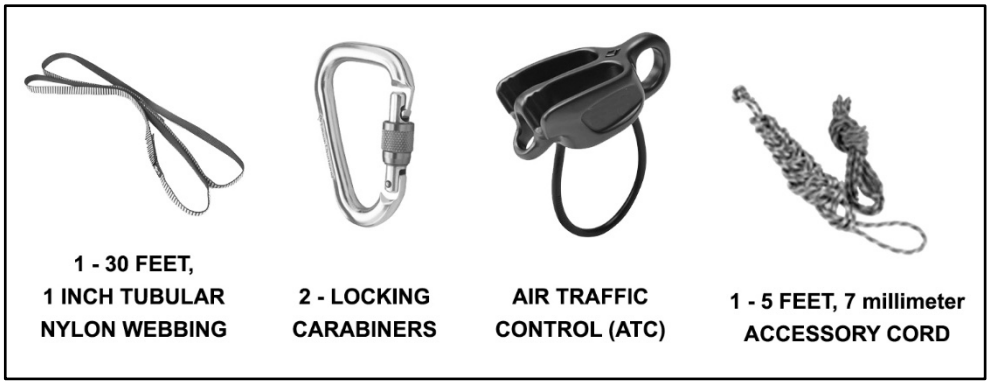


Figure 9-2. Individual equipment

9-11. In addition, each squad should have two to three mobility specialists who carry (see figure 9-3 on page 118):

- 3 x locking carabiner.
- 2 x 8 feet, 1-inch tubular nylon.
- Air traffic control.
- Velocity tether Prusik.
- MicroSpikes.

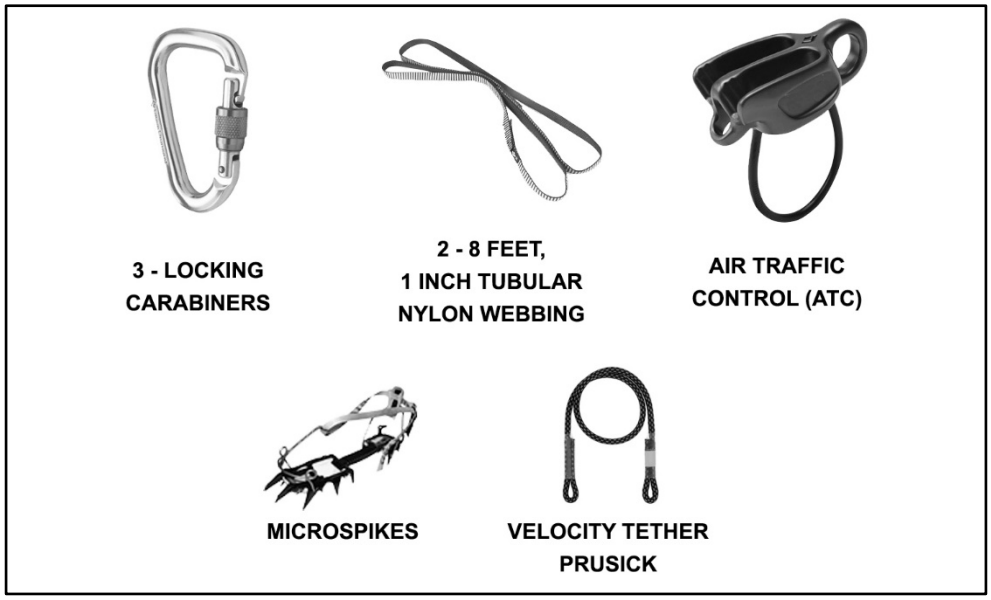


Figure 9-3. Mobility specialists

9-12. In addition to the individual equipment, if rope-based mobility is planned, each squad should carry 2 x 150 feet, 9-mm kern-mantle ropes (see figure 9-4).



Figure 9-4. Squad equipment

9-13. Some equipment can be used to aid insertion or extraction efforts. This equipment is considered expendable and can be left behind to reduce the complexity of systems and increase speed (see figure 9-5).

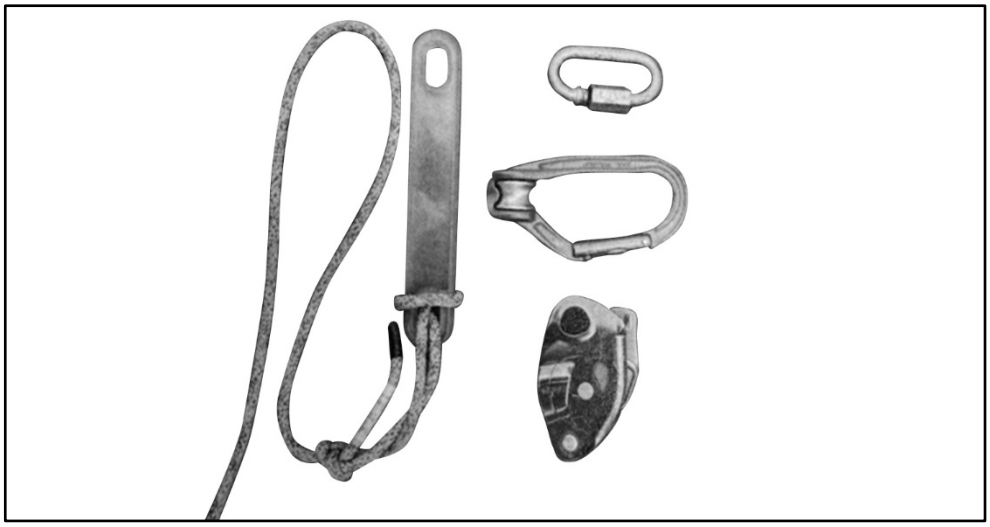


Figure 9-5. Expendable equipment

9-14. Specialty equipment includes the following (see figure 9-6):

- Equipment for personnel recovery.
- Air traffic control.
- Pulleys/Roller-Clip.
- Additional sewn runners.

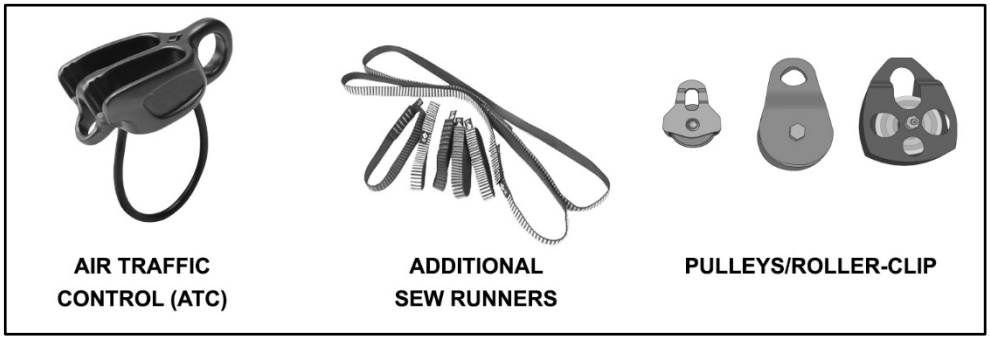


Figure 9-6. Specialty equipment

9-15. Specialty equipment for technical access includes the following:

- VT Prusik or Sewn Runner.
- Gri Gri Device.
- Additional Accessory Cords.
- Rated Quick Links.
- Fiddlestick and Pull-Cord.

SECTION III – DISMOUNTED MOBILITY

9-16. The jungle and CCTE terrain can often necessitate the use of rope-based mobility aids to move personnel through an area and to an objective. The use of a specific type of rope-based system will be informed by the operational requirements and METT-TC (I) (see figures 9-7 to 9-23 on pages 120 to 133).

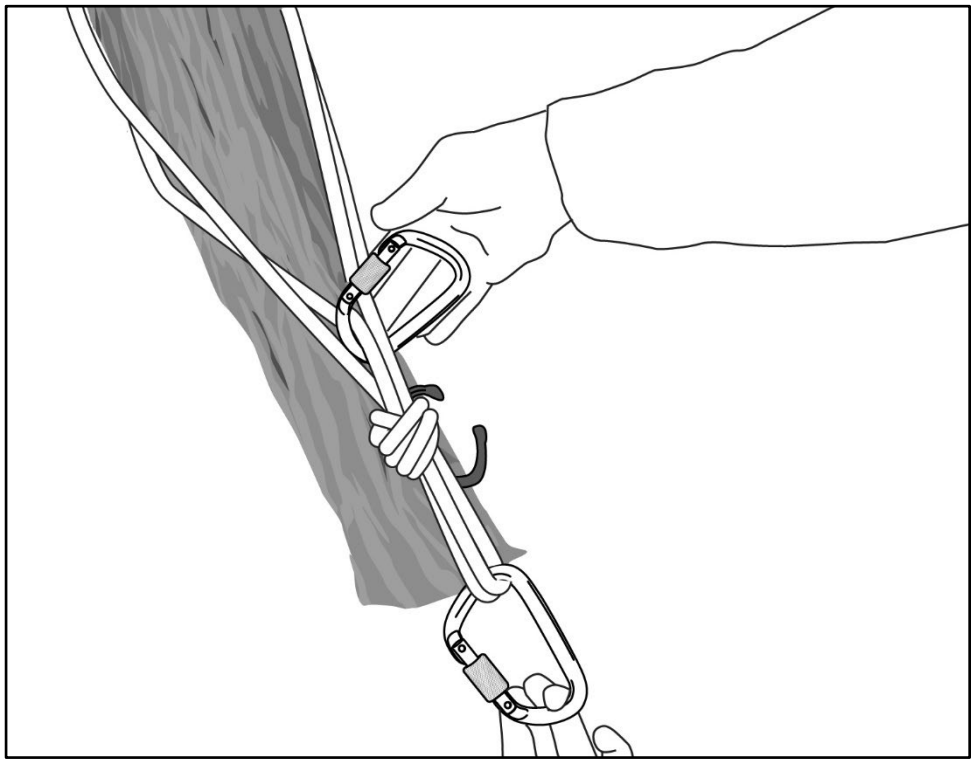


Figure 9-7. Cordage/tubular nylon anchor for hauling/lowering

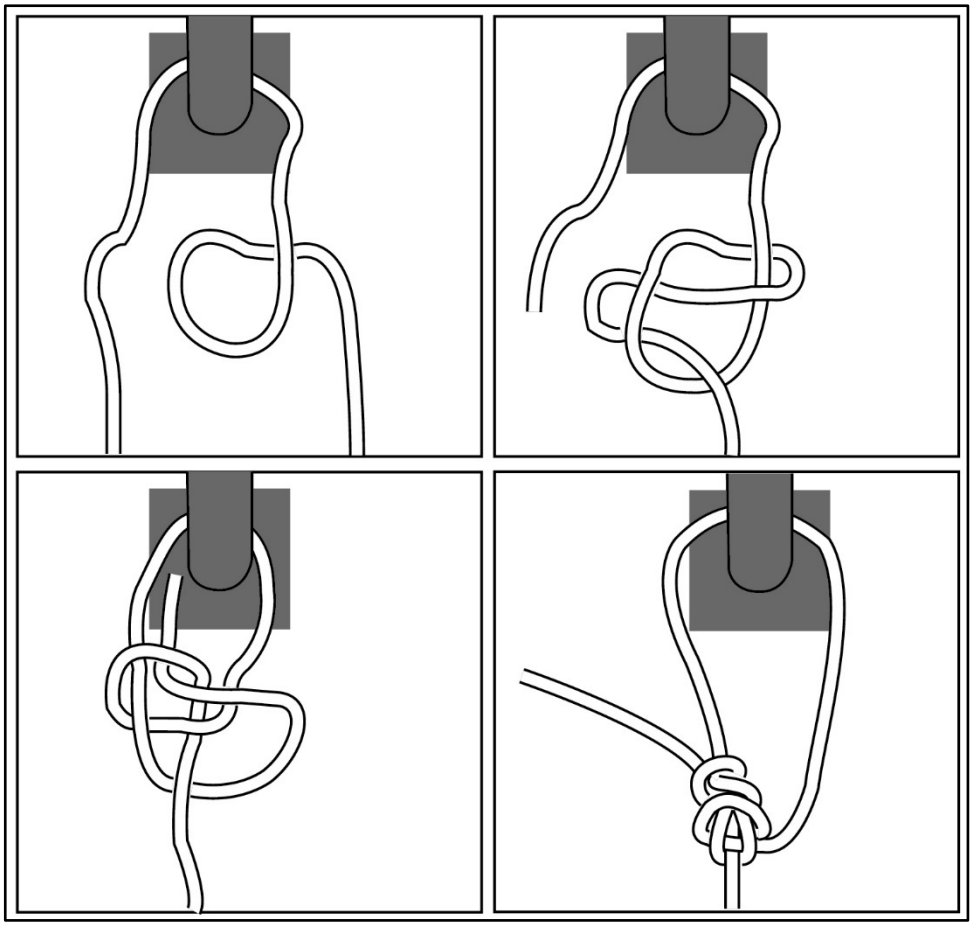


Figure 9-8. Tie-off with bowline

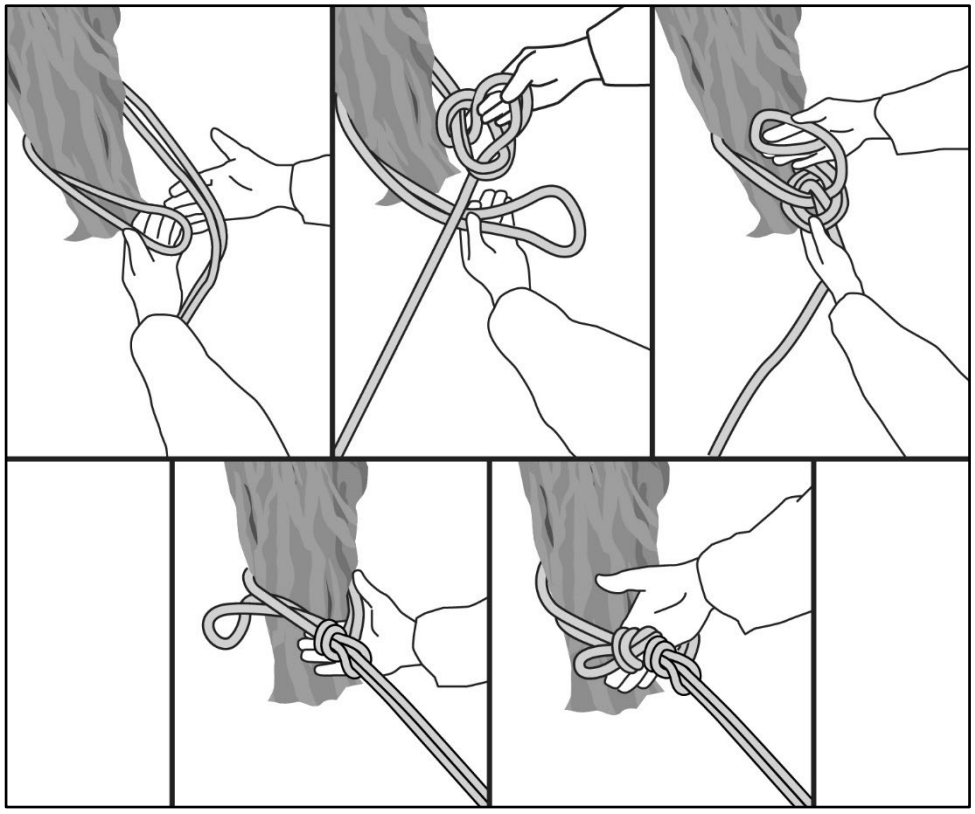


Figure 9-9. Bowline on a bite

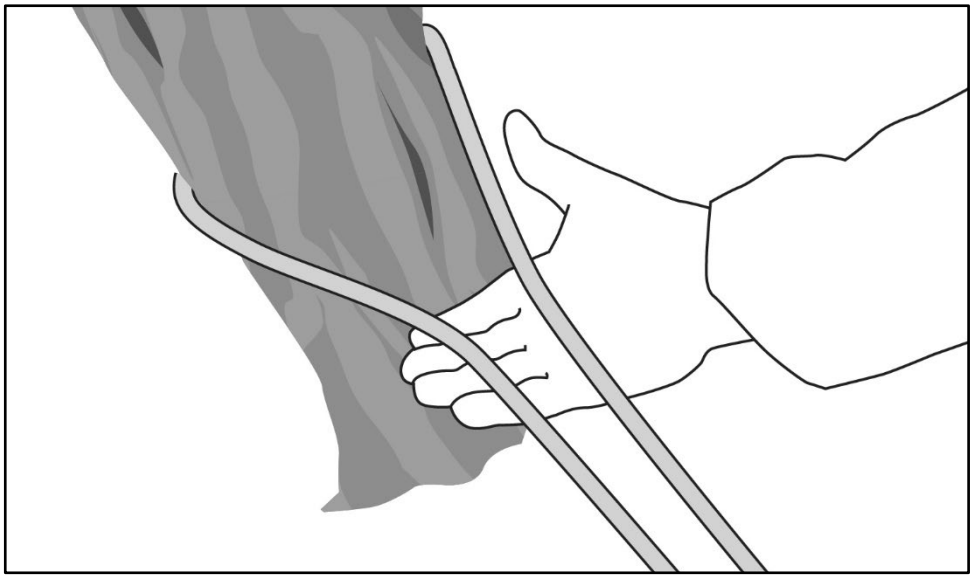


Figure 9-10. Around the tree (half rope)

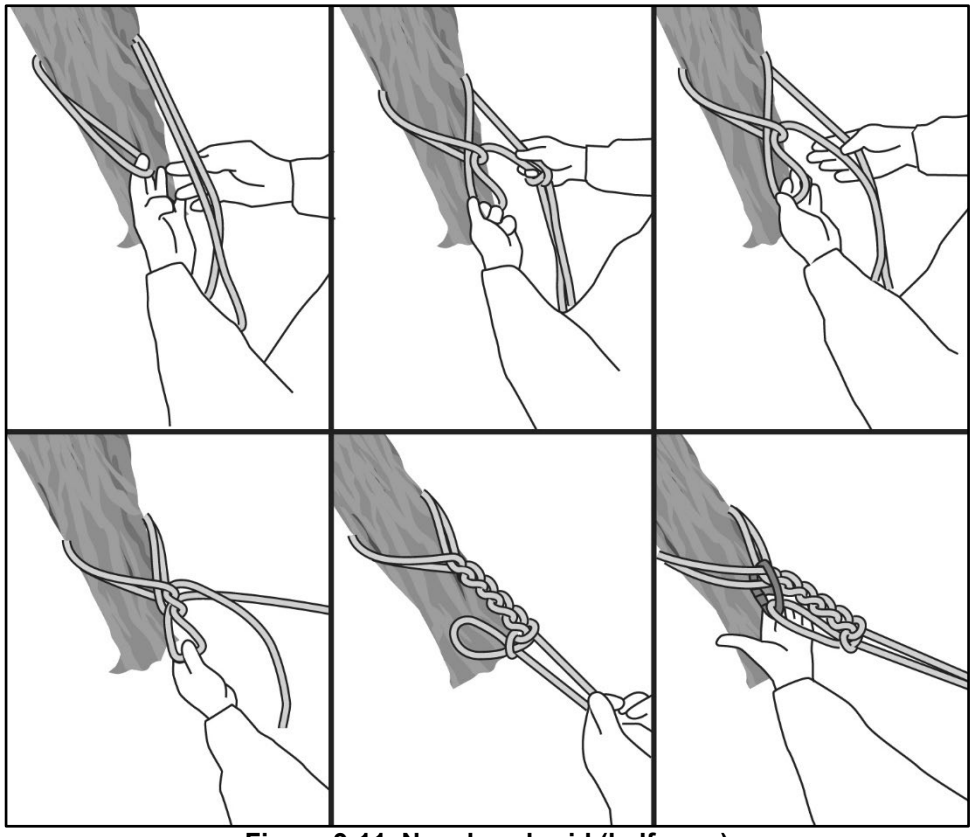


Figure 9-11. Nepalese braid (half rope)

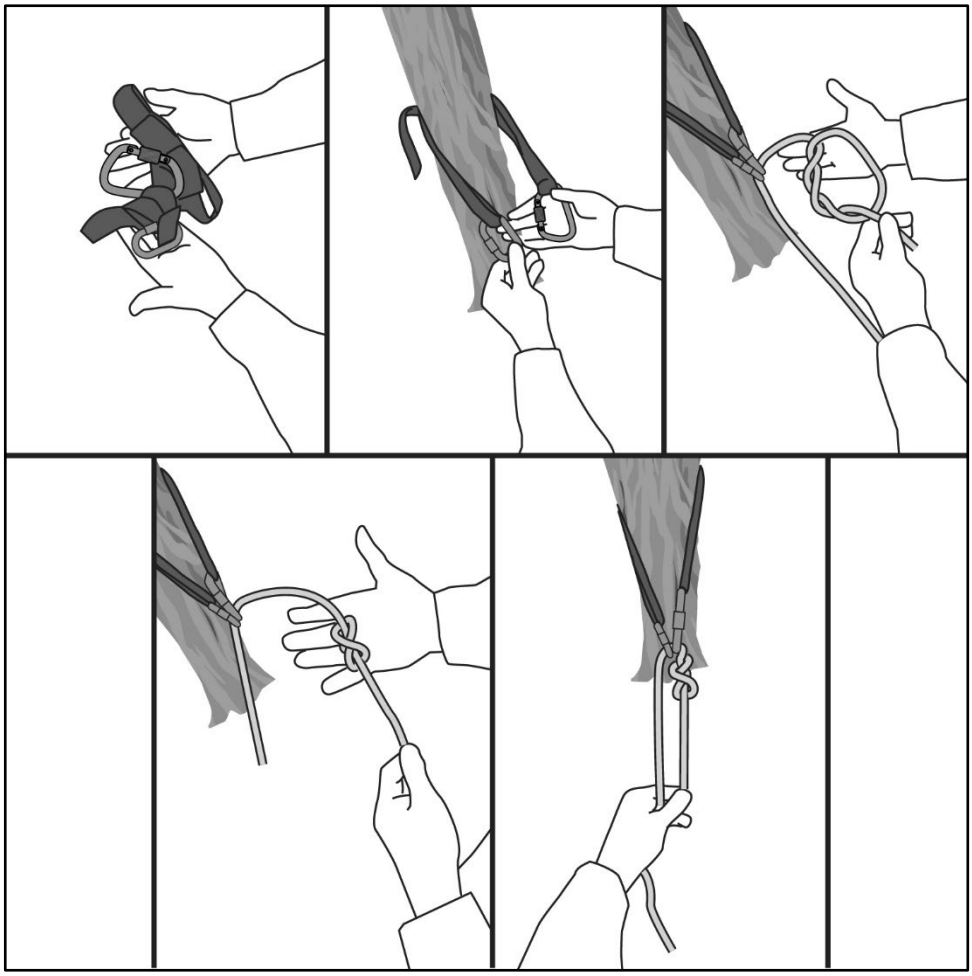


Figure 9-12. Two carabiner sling (half rope)

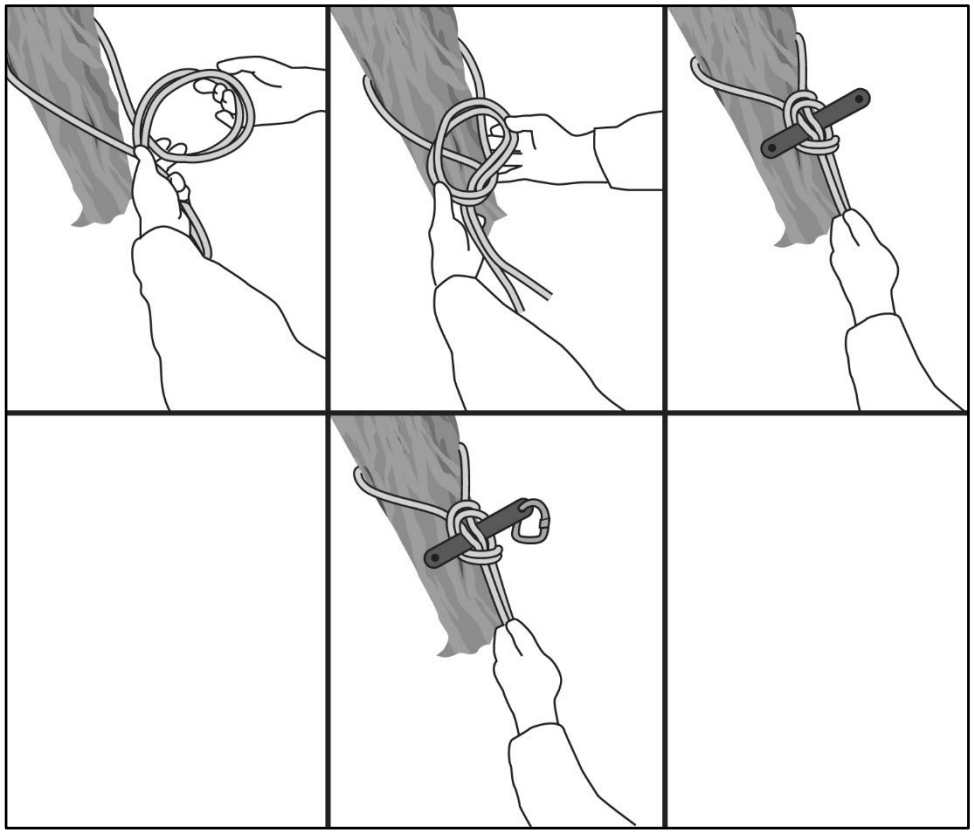


Figure 9-13. Fiddlestick and pull-cord (full rope)

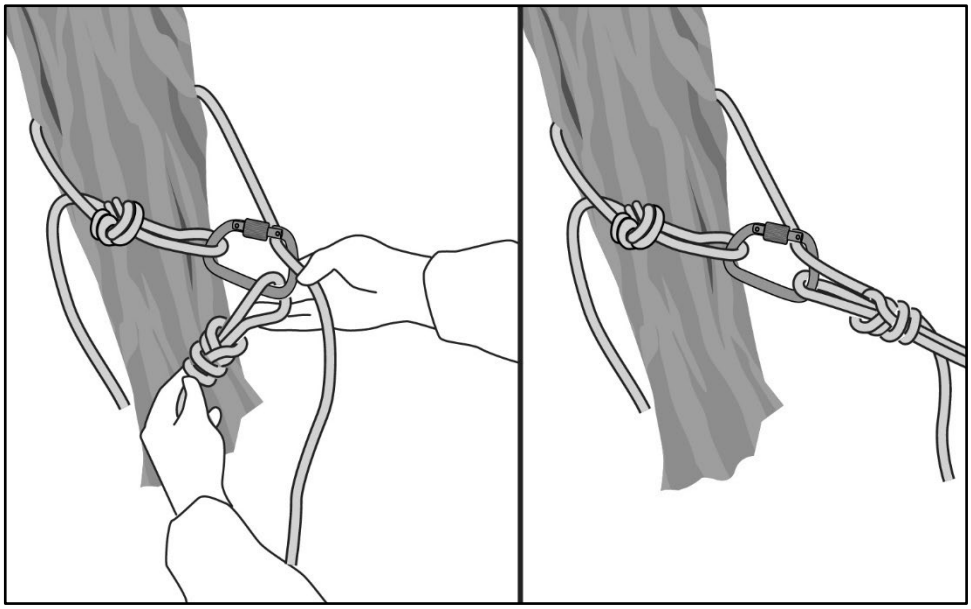


Figure 9-14. Carabiner on a figure 8 with pull-cord (full rope)

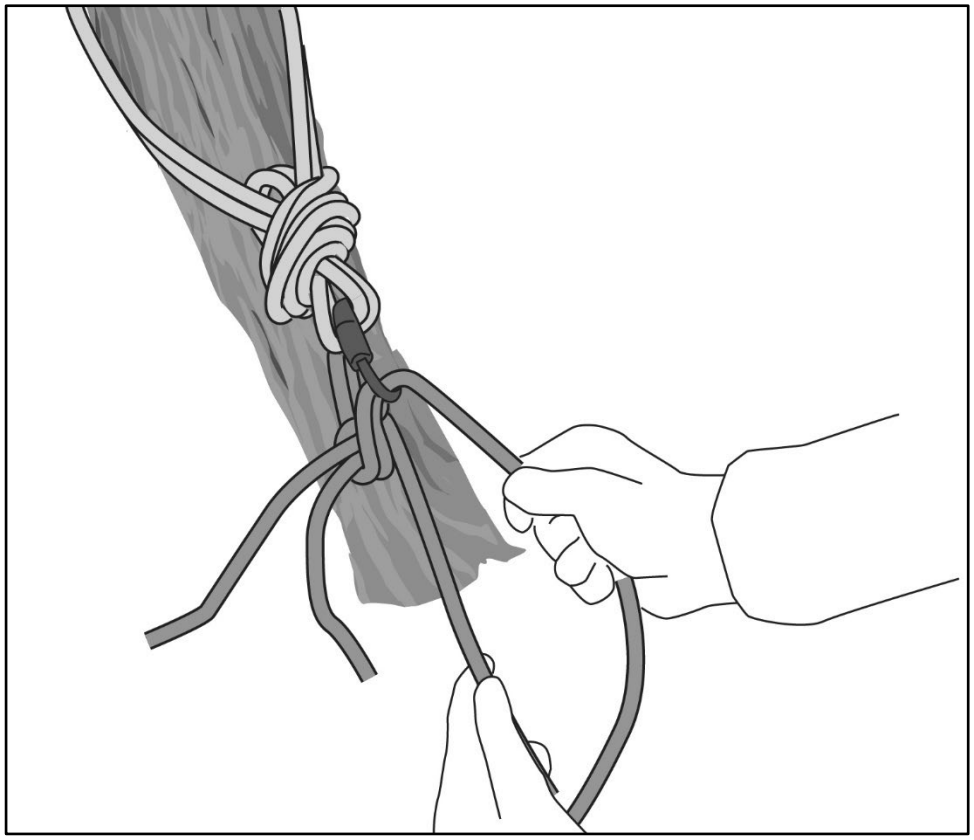


Figure 9-15. Euro death knot (full rope)

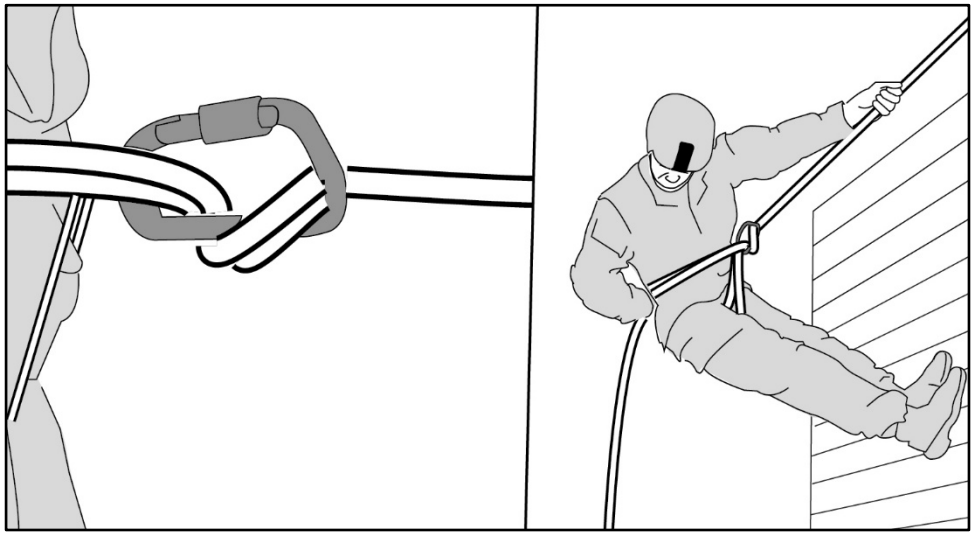


Figure 9-16. Rappel

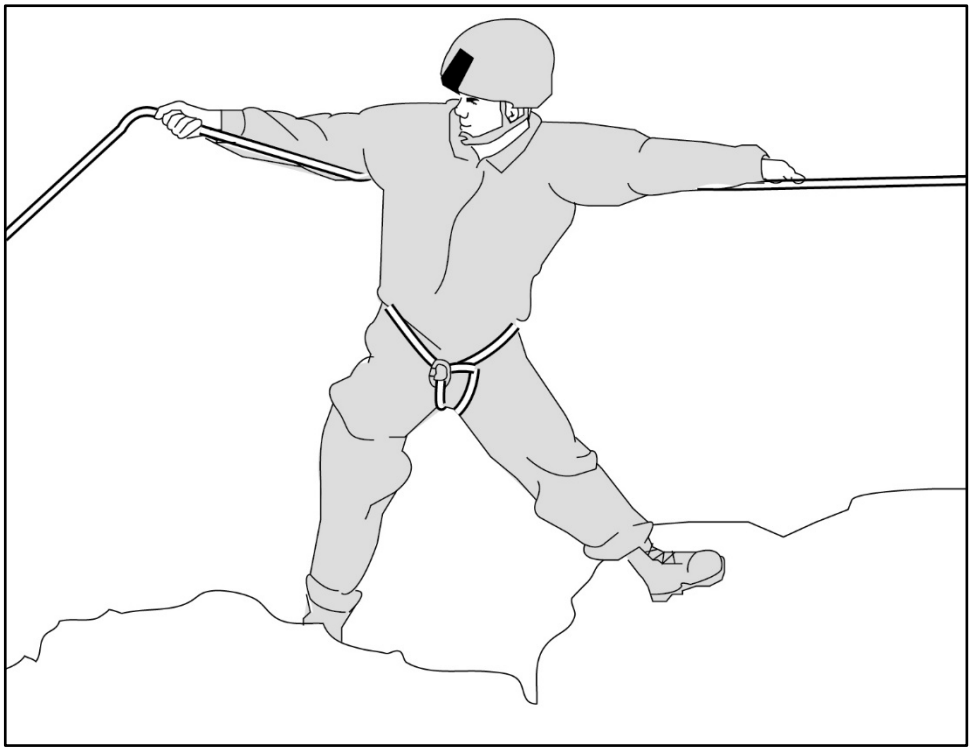


Figure 9-17. Hasty rappel

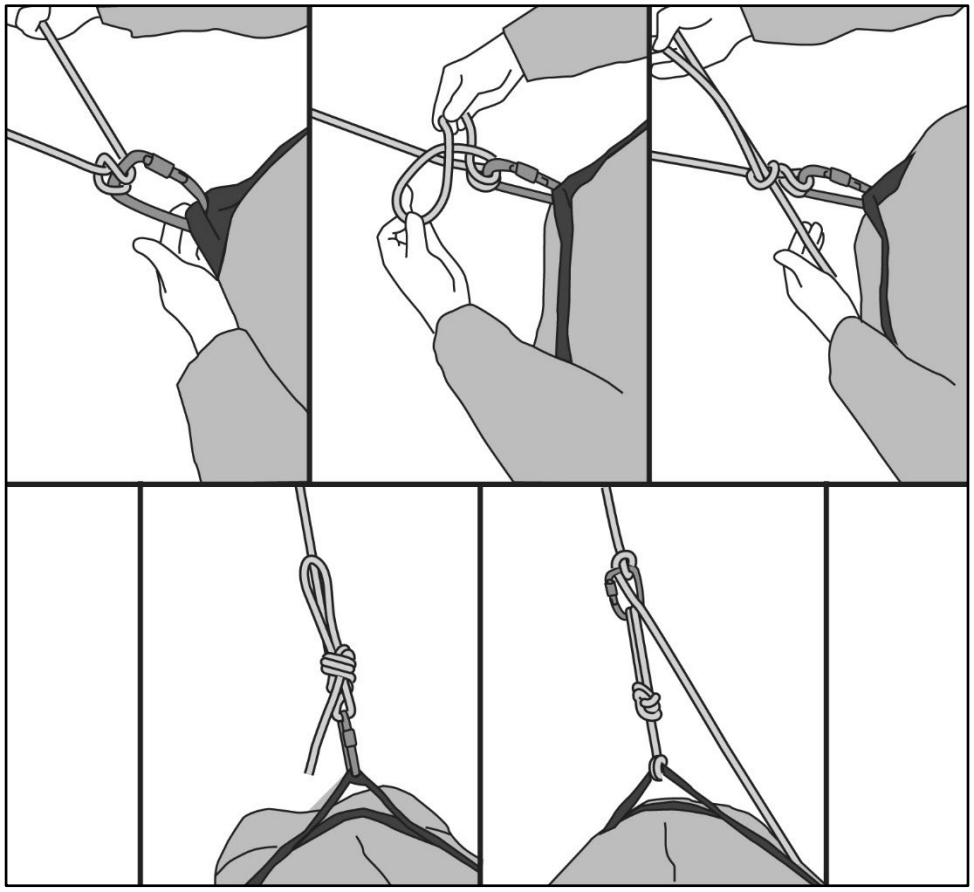


Figure 9-18. Munter with mule

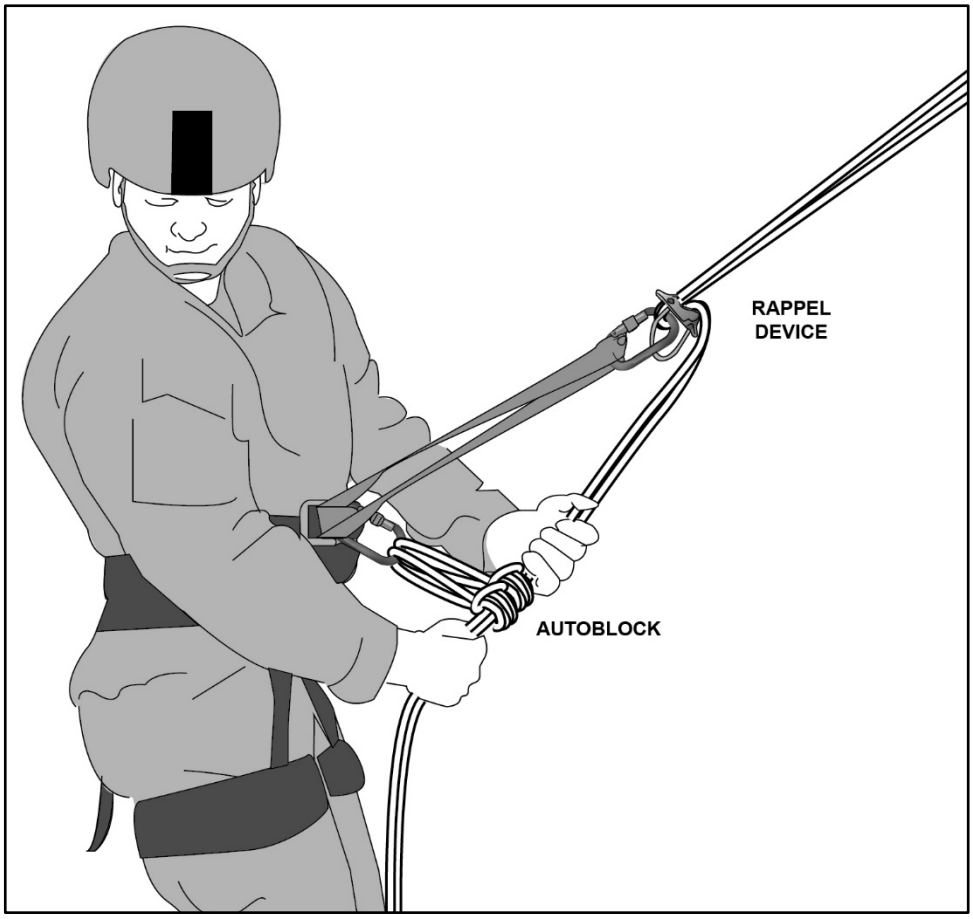


Figure 9-19. Extended rappel with third hand

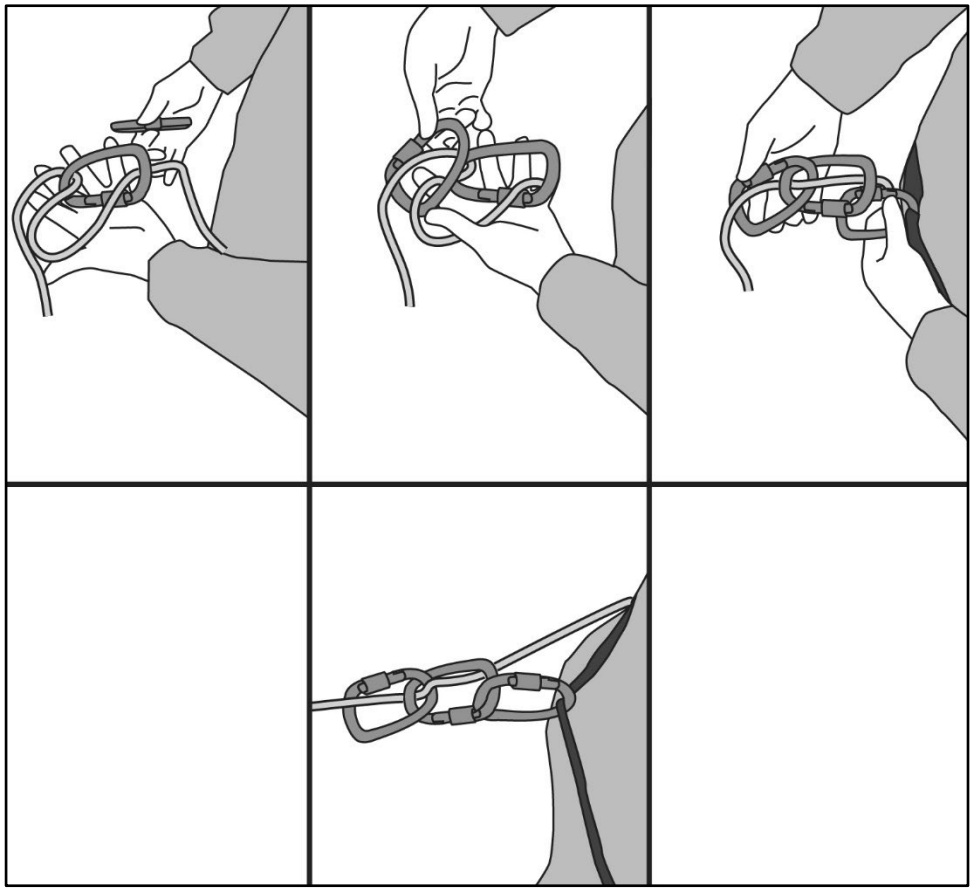


Figure 9-20. Three carabiner improvised device

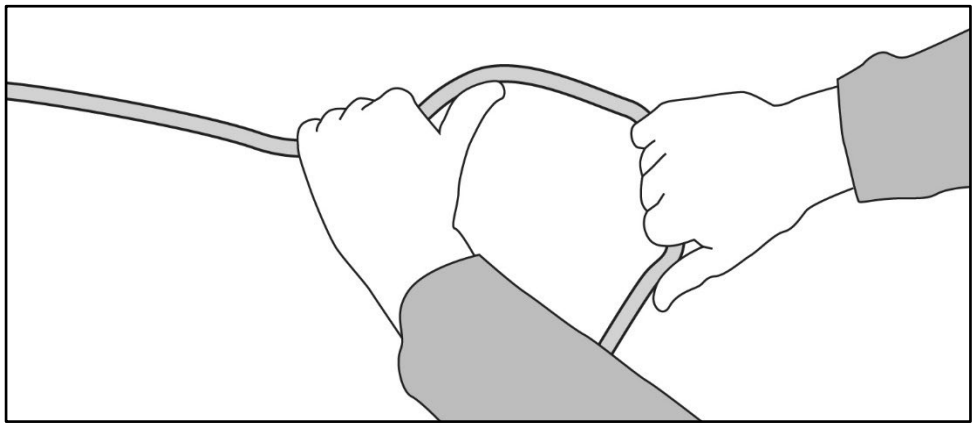


Figure 9-21. Hand over hand

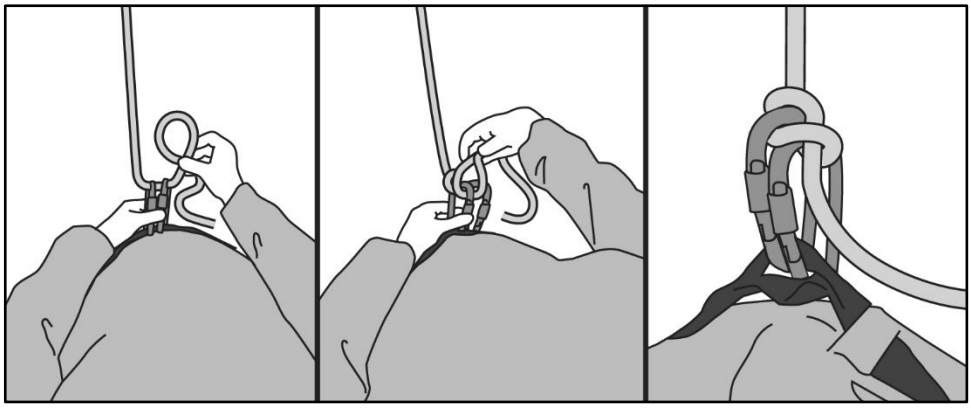


Figure 9-22. Ascender

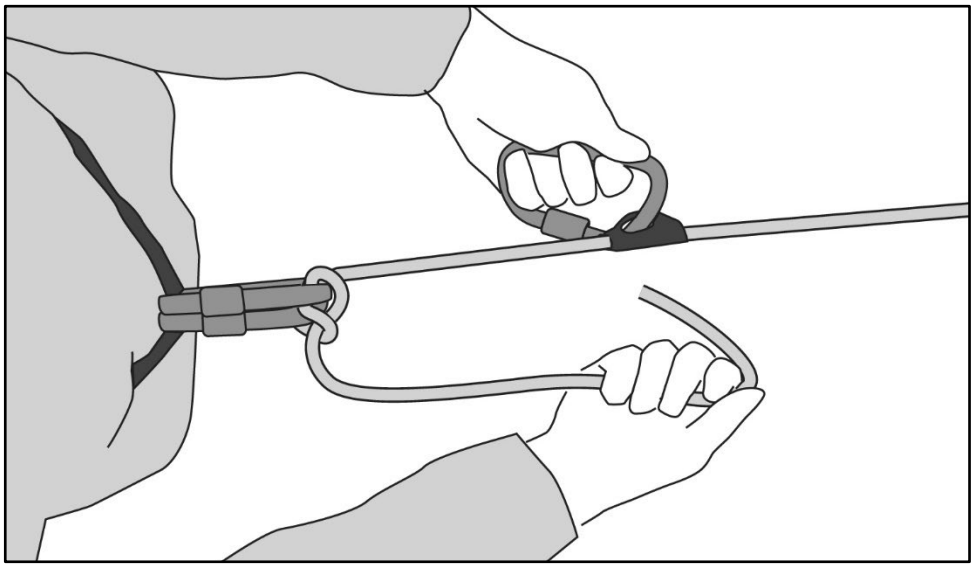


Figure 9-23. Tiblock/carabiner

SECTION IV – ROPE SYSTEMS/INSTALLATIONS

9-17. Rope systems are required to understand for an element to move through the jungle. The following systems are required to understand (see figures 9-24 to 9-27 on pages 134 to 136).

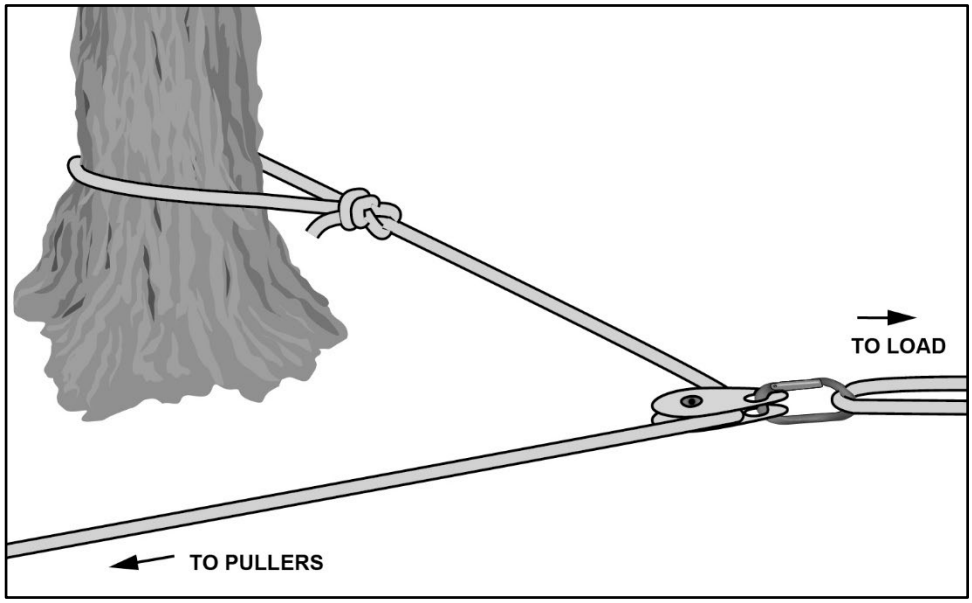


Figure 9-24. Haul systems

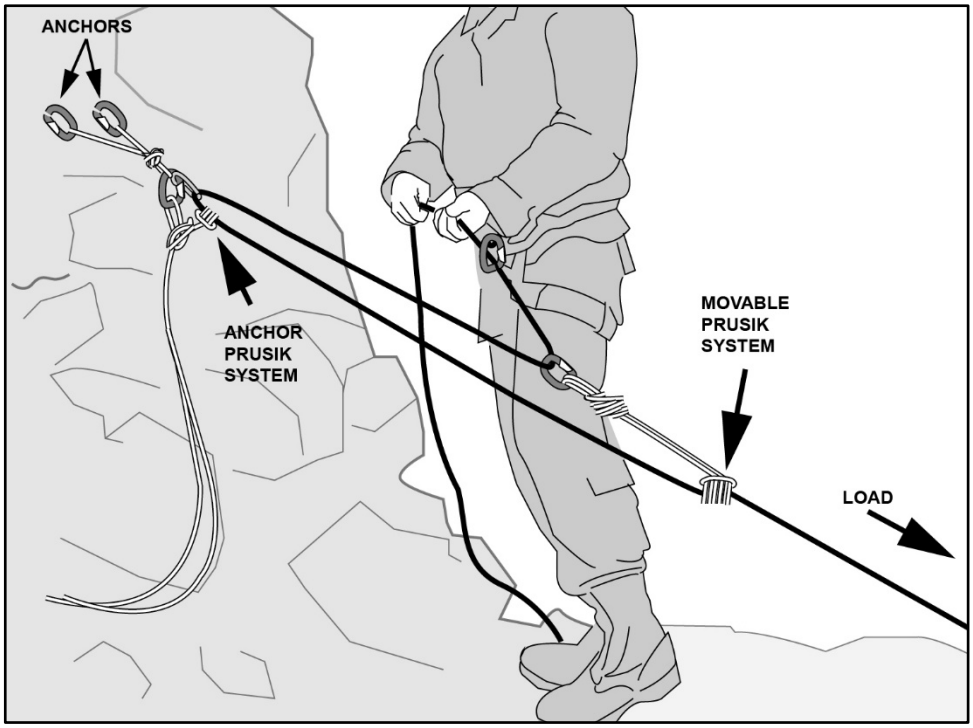


Figure 9-25. Line haul system (Z-pulley)

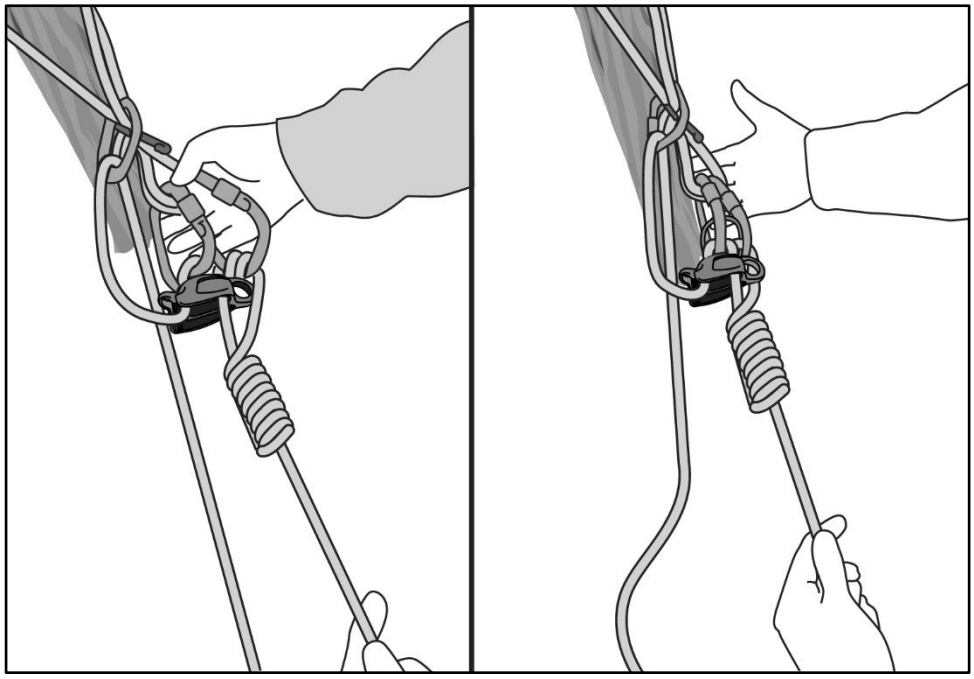


Figure 9-26. Air traffic control from anchor with safety

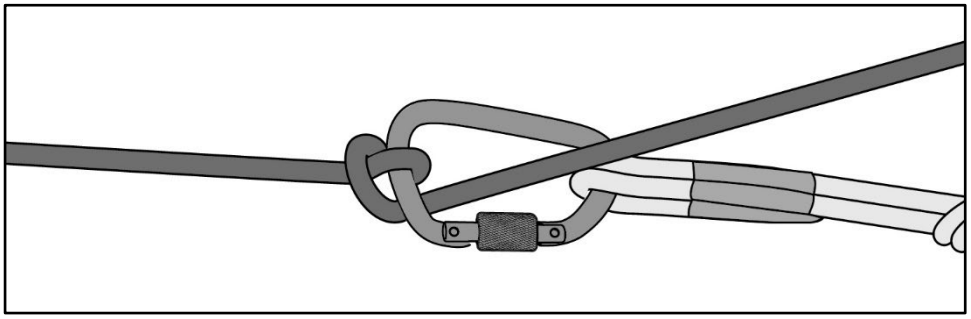


Figure 9-27. Munter hitch

9-18. Paragraph 9-20 is an assessment that can be used to assess a squad on their ability to implement rope systems and move through the restrictive jungle terrain. This is a team drill with a 30-minute time limit.

9-19. Equipment: Squad should have the minimal equipment needed to accomplish the task, or any equipment that is planned to be used operationally.

9-20. Standards: All mobility operations conducted as a part of this drill are done safely and with the correct checks from the mobility team leader assigned. The team is allowed to leave behind any expendable equipment that would be left on operation (tubular nylon, rappel ring, quick link).

9-21. Sequence:

- 1. Team builds anchor on designated anchor point on top of slope or wall.
- 2. One member rappels down to a casualty on a Munter to a simulated casualty.
- 3. The team member mules off and converts a system to a 2:1 haul system and is hauled back to the top.
- 4. The medic will hasty rappel down to the simulated casualty and attaches properly to the litter while the remainder of the team at the top converts the anchor to a 3:1 line haul system.
- 5. The team hauls the patient and litters to the top.
- 6. Every member of the team that has not been to the bottom hasty rappels down.
- 7. All team members ascend the rope back to the top.
- 8. The team builds a lowering system once at the top and lowers the patient and medic to the bottom.
- 9. The remaining team members rappel down the rope using the method of their choosing. The anchor should be converted to a recoverable system if not already done so.
- 10. The last Soldier to rappel down recovers the rope.
- 11. Time ends when rope is recovered.

SECTION V – INSERTION/EXTRACTION METHODS

9-22. Due to the challenges of movement through the jungle formations can utilize special insertion and extraction methods through the air.

AIR ASSAULT

9-23. Deploy Soldiers via rappelling with equipment at heights up to 120 feet into AOs that have no viable LZ.

- Advantages:
  - Height at which can be executed (up to 120 feet).
  - Deployment of Soldiers without landing can penetrate minor canopy.
  - Safer method of insertion due to being harnessed in.
  - Soldiers can rappel with ruck/equipment.
- Disadvantages: slower rate of Soldiers deploying to ground, unable to jettison ropes, either pull in or cut.

FAST ROPE INSERTION

9-24. The Fast Rope Insertion (FRIES) is used when a fast exit into a small or restricted area, to include overwater operations, is required. It provides a method for inserting and extracting personnel in critical areas when the aircraft cannot land.

- Advantages:
  - Fast deployment of Soldiers.
  - Can be deployed into water.
  - Can double as extraction method as well.
  - Easy recovery of ropes.
- Disadvantages:

- Higher risk due to not being harnessed on rope.
- Additional descending tools required for equipment over 60 pounds.
- FRIES operations will not be conducted in densely wooded areas unless there are clear area(s), large enough to support the rope operation with 60 feet maximum deployment.

SPECIAL PURPOSE INSERTION

9-25. Special Purpose Insertion (SPIES) was developed to rapidly insert or extract personnel from an area where landing is not possible. SPIES procedures can be used for rough terrain as well as water extraction (wet-SPIES) operations.

- Advantages:
  - Safest extraction method when landing is not possible.
  - 120 feet in length.
  - Can penetrate minor canopy.
  - Can carry 14 personnel and up to 5,000 pounds of equipment.
  - Can be used in waterborne operations.
- Disadvantages: maximum of 20-minute flight time (waivable).

Chapter 10

Riverine Operations

In the CCTE/jungle environments, inland waterway travel provides an efficient means of travel for both people, trade, and military operations to areas that are otherwise not trafficable. Most villages and population centers will be situated with access to these river ways. Using waterways for troop and logistic movement, as well as denying use of these waterways to the enemy with severely reduce the operational efficiency of the enemy.

SECTION I – USE OF BOATS

10-1. Waterways in the jungle allow for fast movement. Utilization of boat/watercraft can help with the movement but require steps in planning for the use of boats.

USE OF WATERWAYS

10-2. Waterways should not be viewed as only an obstacle, but also a simple and effective means of movement and transportation. All Infantry units should be able to utilize waterways, as well as a special team dedicated to water movement dependent on the operating environment. A waterway can provide the following:

- Large numbers can move over great distances relatively efficiently as compared to other methods.
- Logistic and resupply efforts can be moved to and from desired locations.
- When operating near rivers, CASEVAC plan should always include a boat option. Casualties can be extracted when air is not available and there are no other trafficable routes to the location.
- Large craft can be used to move equipment long distances that are too heavy for aircraft or ground transport.

ORDER OF EVENTS

10-3. The general planning factors and sequence of events relevant to riverine operations include the following:

- (1) Complete an estimate.
- (2) Studying the river.
- (3) Selection and preparation of boats.
- (4) Orders.
- (5) Rehearsals. All drills should be rehearsed thoroughly so that all Soldiers and coxswains have a complete understanding of any actions-on to be used during the patrol.
- (6) The move.
- (7) Action on objective.
- (8) Extraction (by boat if applicable).

10-4. Commanders should complete a full estimate from which they will determine the number of boats and most effective method of movement.

10-5. A river must be studied in detail. This study will enable the commander to determine whether the planned move is feasible or not for some sources of information which may be available.

- Charts and maps.
- Aeriel reconnaissance or photographs.
- Previous patrol reports.
- Local knowledge.
- Reconnaissance by watercraft.
- Tide tables and almanacs.
- Coastguard/local harbor master.
- Weather reports.

10-6. There are also information requirements which include:

- Tidal rivers will affect the operation as some obstacles may only be navigable during certain tidal conditions
- The strength and direction of current can affect boat speeds and fuel consumption.
- Width.
- Depth.
- Texture of a river bottom. This is to determine proper anchorage as well as bank conditions for embarkation and disembarkation.
- Depending on the geographic region, the season can dramatically change the trafficability of a river or waterway. If pro-longed operations are occurring, this estimate should be made to support the overall effort (see figure 10-1).

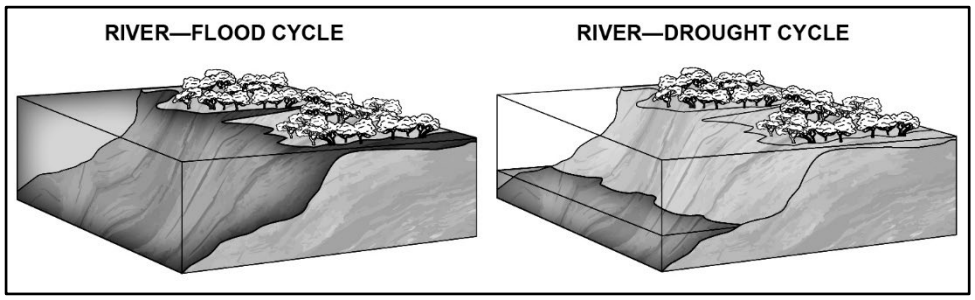


Figure 10-1. Amazon River during flood and drought cycle

- Rapids. These should always be reconnoitered by a dismounted patrol.
- Other factors include weather, obstacles, debris, and civilian population travel.

SELECTION AND PREPARATION OF BOATS

10-7. The boats that will be used should be adequate for the mission and METT-TC (I) analysis. Improvements to the boats must be made if needed and should be planned into the timeline. Additionally, consider other preparation such as adding padding to paddles if using to approach an objective in a metal boat to reduce noise.

10-8. The craft available to a commander falls into three categories from which one should consider using one type or a combination of boats as follows:

MILITARY CRAFT

10-9. (Army) The rigid inflatable boat is a rigid hull craft with a 100-square feet (9.2-square meters) of deck space and a center console design. It can carry 3,815 pounds (1,730 kilograms) of payload with a full tank of fuel. Twin outboard engines are hard mounted to the craft with sufficient power to meet payload and performance requirements. The rigid inflatable boat is towed and fielded on its own Department of Transportation compliant trailer, with an interchangeable pintle ring and ball type hitch with a surge type braking system to ensure inter-operability between military and civilian vehicles. This trailer is compatible with the Light Medium Tactical Vehicle and/or Medium Tactical Vehicle depending on mission specific payload requirements (see figure 10-2).

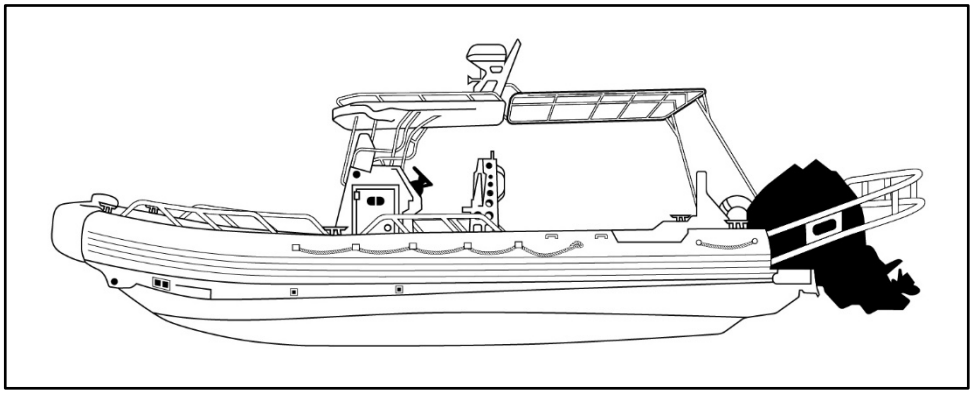


Figure 10-2. Rigid inflatable boat

10-10. (Army) Inflatable Combat Raiding Crafts (I-CRC) are inflatable boats that operate with a paddle for stealth or powered for speed. Each boat is built for rapid deployment, high performance, and reliability. Each boat is designed for a variety of military missions and maritime patrol. The missions include combat reconnaissance, search and seizure, boarding operation, search and rescue, and insertion and extraction (see figure 10-3 on page 142).

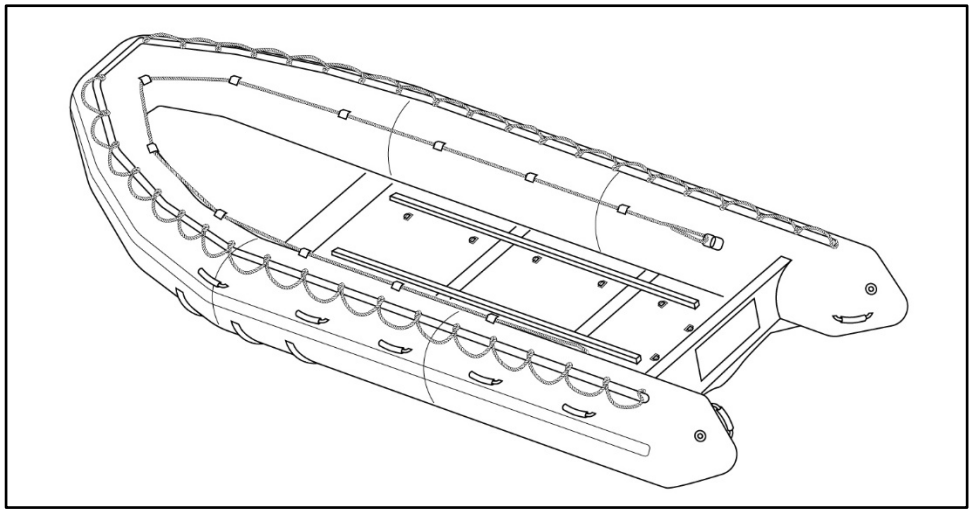


Figure 10-3. Inflatable Combat Raiding Crafts (I-CRC)

10-11. (Navy/Special Operations Command) Special Operations Craft Riverine (SOC-R) is an armored vessel with ballistic protection (up to 7.62mm x 39mm ball) for the engines, helmsman and gunners. Its hull is made of aluminum with fiber reinforced polymer accessories. The SOC-R is designed to be air transportable, with one SOC-R, its tractor towing unit, associated with small boat team personnel and Navy Sea, Air, and Land (also called SEAL) passengers and all their mission gear fitting into a single C-130 aircraft. SOC-Rs can also be transported as under slung loads by medium-lift and heavy-lift helicopters (see figure 10-4).

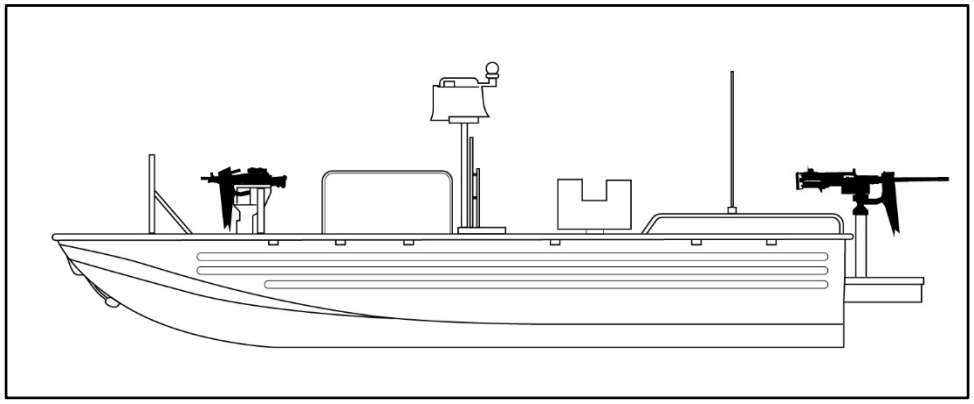


Figure 10-4. SOC-R

CIVILIAN CRAFT

10-12. Civilian craft of any size may be commandeered. These will often be equipped with sophisticated equipment such as radar and navigational aids that would otherwise not be available. Civilian craft can be used to accomplish any of the roles fulfilled by

military craft; however, it will often be far less robust and require more time for preparation.

INDIGENOUS CRAFT

10-13. Small local craft can be used for tasks such as the covert insertion of reconnaissance patrols, or for patrolling narrow rivers which would otherwise prove inaccessible (see figure 10-5).

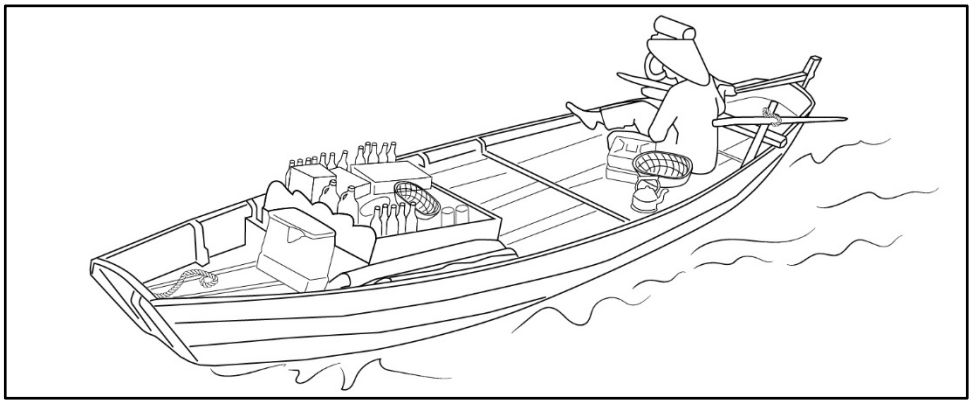


Figure 10-5. Indigenous craft

ORDERS

10-14. A specific boat movement annex should be added into the orders for riverine operations. This annex should include:

- 1. The preparation required for the boats.
- 2. Coordinating instructions between boat commanders and coxswains from a different unit.
- 3. Speed, pacing, and formations to be used.
- 4. Method of movement to be employed.
- 5. Detailed route description while on the water.
- 6. Signaling while in the boats.
- 7. Actions on contact, breakdown, and towing while in the boats.
- 8. River and tidal details.
- 9. Emergency drills.
- 10. Logistical requirements.
- 11. Bump plan.

MOVEMENT

10-15. The drills for embarking and disembarking should be designed for simplicity, safety and speed. They will vary depending on the type of boat being used, military, civilian or indigenous, but must always be rehearsed.

EMBARKATION

10-16. The coxswains should position the boats nose into the bank facing the current flow. This should hold them in position while embarkation occurs. The grouping that is embarking should maintain 360-degree security. One member of each section should collect the life jackets from the boats and distribute them to each person. Working in pairs they should then don the life jackets. Soldiers should then embark onto the boats ensuring that all equipment that is not secured to their person is attached to a center-line rope in the boat. All round defensive positions should gradually collapse as members of the formation embark. It may be necessary for the last member of each section to hold the boat and give a push-off from the bank.

DISEMBARKATION

10-17. If not in contact, the coxswains should position the boats nose into the bank facing the current flow. This should hold them in position while embarkation occurs. If in contact the chances are that the boat will be positioned/rammed directly into the bank. One member of each boat holds it steady while the remainder disembark to positions of all round defense. Life jackets are then removed in pairs, collected by one member of the group and returned to the boats. The formation is then ready to move off (see figures 10-6 to 10-9 on pages 144 to 146).

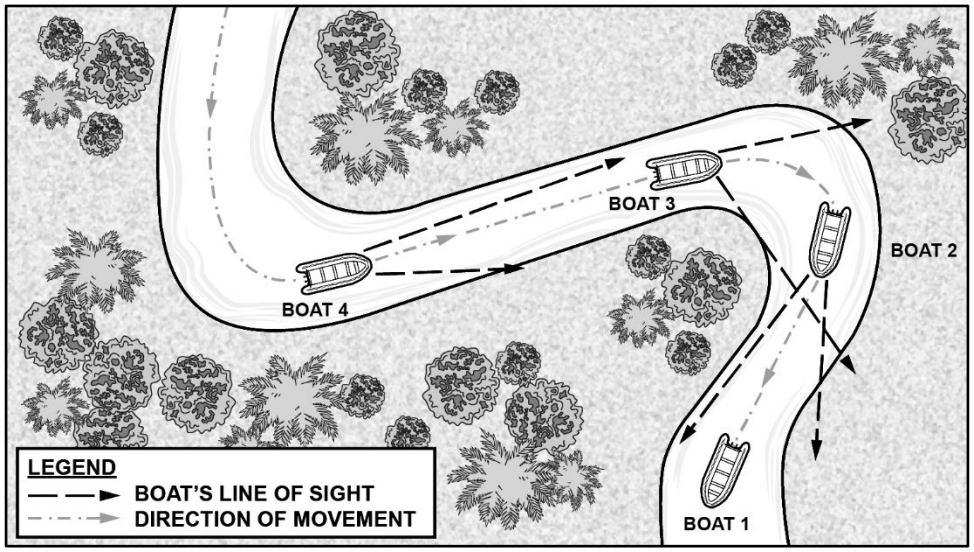


Figure 10-6. Boat movement: line of sight

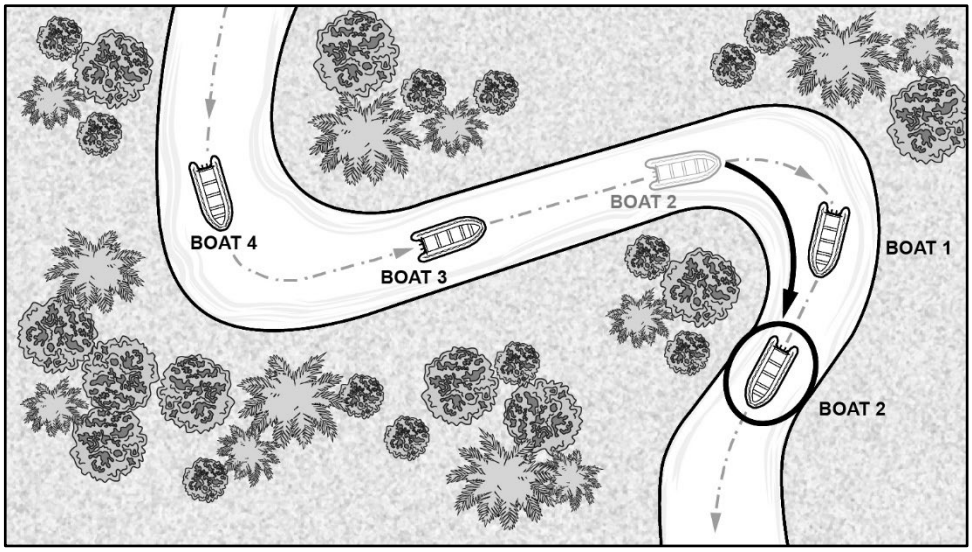


Figure 10-7. Boat movement: leap frog

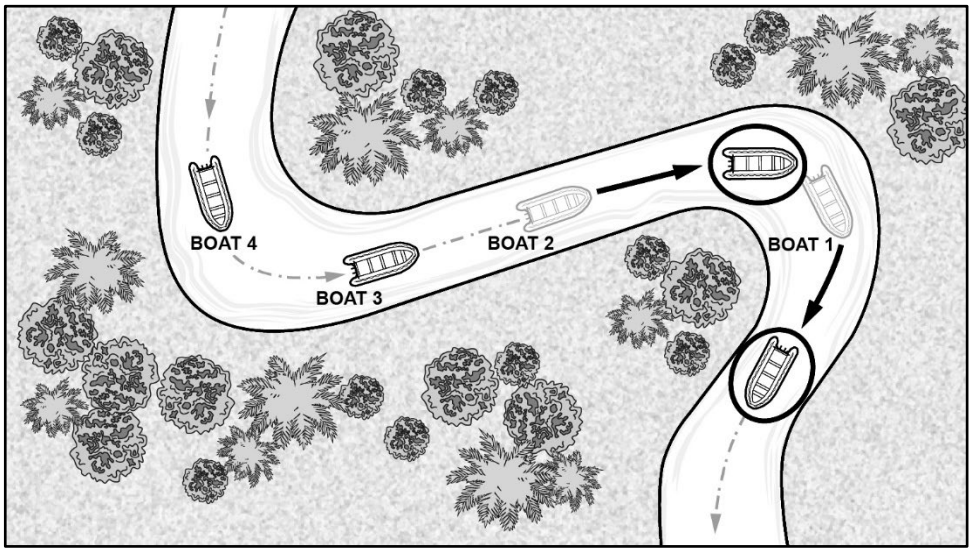


Figure 10-8. Boat movement: caterpillar

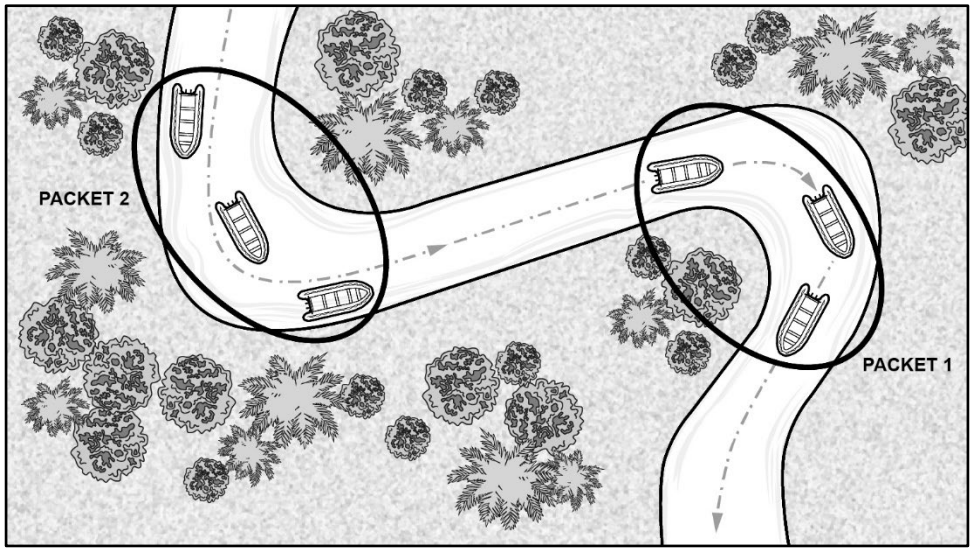


Figure 10-9. Boat movement: packets

10-18. Formations should be chosen that are best suited based on METT-TC (I) analysis. Common formations are the file, staggered column, V, echelon left, echelon right, and line.

ACTIONS ON

10-19. The method of contact drill that will be used during operations should be analyzed using the METT-TC (I) framework to determine the most efficient method to support the overall mission. Paragraphs 10-20 to 10-22 are the three main types of boat contact drills.

WITHDRAWAL

10-20. The withdrawal is only suited to two occasions. A distant contact front and in a contact where the river ahead has been blocked by the enemy or the natural flow of the ground. During any form of close contact, it will most likely cause too much time to be spent in the killing area as boats turn around. It should also be noted that there will still be a requirement to return to the point of contact and clear the firing positions at a later point. If this is not done, then the friendly forces accept that the enemy has control from that point of the river forwards and friendly forces will therefore have reduced freedom of maneuver and ability to influence that part of their area of responsibility.

DRIVE THROUGH

10-21. This is the simplest and fastest form of response. It will rely on heavy use of suppressing fire and fast boats. Boats should seek to push through the killing area as quickly as possible and once through should pull closer into the ‘enemy bank;’ the thickness of the vegetation will place them quickly out of the enemy’s arcs. To allow for this burst of acceleration it is advised that the standard patrol speed is 2/3 throttle or less.

COUNTERATTACK

10-22. The sequence of events is as follows:

- a. Contact is initiated. All personnel on that side of the boat return rapid suppressing fire.
- b. The boat in contact maintains forward momentum, to increase the distance from the contact point, and moves diagonally to the opposite bank to the enemy. The Soldiers disembark and return fire across the river, becoming the support by fire element.
- c. Boats not in contact converge on a point approximately 100 meters away from the enemy and disembark. The exact beaching point is dictated by the boat that is closest to the enemy but out of contact. This boat will be able to see the area of the firing point where the others cannot and therefore is vital in getting Soldiers to shore at a suitable location for a follow-on assault; the remaining boats follow his lead. This location is the objective rally point for the subsequent counterattack. Life jackets are ditched, an assault formation adopted, and final preparations made as per for a hasty attack.
- d. Soldiers clear the enemy position on foot. Control measures for this attack will include:
  - (1) A full report from the fire support group giving all available information on the enemy. This should include the gird of the enemy, grid of the fire support group, distance of the assault group disembarkation point to the enemy and a bearing upon which the fire support group is returning fire.
  - (2) Orders, including the following information:

    (a) The assault bearing.

    (b) Timing.

    (c) Method of marking the forward line of own troops of the attack. This can either be by boat, person, or signal in line with the front of the attack and will ensure that the fire support on the far bank know exactly where assaulting Soldiers are.

    (d) The signal for the fire support group to switch or cease fire.

    (e) Any boat that is on the other side of the contact from most of the patrol (who are assaulting on foot) can deploy Soldiers as cut offs.

OTHER CONSIDERATIONS

10-23. Smoke. Some varieties of smoke can be deployed direct into water and still work however this is not always the case, especially if the grenade does not float or it is a phosphorus-based smoke. Experimentation should be conducted to see what does and does not work with the types of smoke grenades that are available.

10-24. Personal protective equipment. Military life jackets are generally designed to be work correctly in conjunction with the correct wearing of issue body armor. A check, however, must be conducted to confirm this dependent on the type issued. Due to the high levels of exposure when on a riverine patrol and the potential for contact, personal protective equipment must be easy to hand for quick use. However, the way rucks are

packed and stowed down the centerline of small craft often makes it impractical to retrieve body armor quickly and the wearing of life jackets also prevents it being donned. It is therefore best to wear body armor from the start of the patrol. A steady breeze produced by the boat's movement and the fact that no strenuous physical activity is being partaken by the Soldiers on board makes this sustainable, even in tropical heat. Life jackets can be worn over the top when on patrol yet still easily removed if disembarking or conducting a counterattack. Helmets should be clipped to webbing and donned in a counterattack situation once the boats have beached, this allows jungle hats to be worn the rest of the time to protect Soldiers against the sun and heat exhaustion.

10-25. Extraction. Extraction methods (if applicable) should be accounted for when planning. This will include location of link-up following operations, order of march, and bump plan.

SECTION II – RIVER CROSSINGS

10-26. In a movement through the jungle a unit will likely have to utilize a method to cross a body of water. The following are different techniques depending on mission requirements.

WATERWAY CROSSING

10-27. Waterways serve as the veins of the jungle and provide life, sustainment, and transportation to indigenous populations and active military forces within the AO. These include rivers, creeks, canals, and other bodies of water which serve as a route.

HASTY CROSSING

10-28. These emphasize speed, surprise, and minimum loss of momentum. They serve as a method to quickly continue movement of a patrol.

DELIBERATE CROSSING

10-29. This type of crossing emphasizes detailed planning and centralized control. They are dependent on the failure or infeasibility of a hasty crossing.

TACTICAL METHODS

10-30. Walk through tactical method includes:

- Requires walking through water.
- The waterway must be shallow enough to facilitate walking or have a current that is not strong enough to sweep away personnel (but may be strong enough to knock them off balance).
- Walking pace should be avoided.
- Bodily flotation aids may be used if necessary.
- Poles may be used for balance and for probing the waterbed for obstacles.
- Rucks should be carried over one shoulder so that they may be easily put down if required.
- Personnel should traverse the waterway using sideway steps or in a crab-like manner while facing upstream.

10-31. Ruck raft:

- Made using carabiners or poles to attach rucks together.
- Ruck rafts should be made with four rucks. A fifth ruck may be attached to aid in transportation of a casualty (fifth ruck secured at one end of the raft to support the casualty's head).
- When using a ruck raft, personnel should enter the water and swim across while using the raft as a flotation device.
- This method is generally only used at the squad level.

10-32. Poncho ruck raft:

- Used as a flotation device while keeping the element in two-person teams and maintaining security.
- Will keep sensitive items dry if properly utilized.

10-33. One-rope bridge:

- Can be used to cross a waterway by tactically extending a squad rope from the near side to the far side.
- Allow the element to use the rope as a handrail or to cross above the water to remain dry.
- Hand-to-hand or hand-over-hand method should be used when crossing a one-rope bridge.

ALTERNATIVE METHODS

10-34. Improvised bridges, such as preexisting fallen trees, may provide a bridge across reasonably narrow waterways. The tactical situation will dictate whether it is feasible to use improvised bridges.

PERSONAL PREPARATION

10-35. Individuals should unblouse trousers from boots and turn their pockets inside out to allow water to drain quickly when exiting the water.

10-36. Daily "de-leeching" should also be conducted when operating in jungle environments; this serves to deliberately drain water from uniforms and as an opportunity to remove land leeches.

10-37. Non- or weak swimmers must use the maximum number of flotation aids possible and cross with strong swimmers.

10-38. Each person must use a flotation aid that is secured to their body for all crossings.

- Ideally, this should be an aid that is deliberately built to serve as a floatation device, such as the issued scout swimmer's vest.
- Improvised flotation aids should only be used as a last resort. These are any items which will float and can be used to assist swimmers or to float equipment across a water obstacle.

10-39. The following are a few items that can be used as flotation aids:

- Water bottles and canteens. Six empty water bottles with tops well secured, attached to a belt and worn upside down, will keep a non-swimmer afloat.

Note. After the crossing, empty water bottles should be refilled when tactically appropriate.

- Clothing. Trousers tied at the ankles, soaked in water and filled with air, can be used to assist weak swimmers. The waist can be tied or held together underwater by the swimmer.
- Natural resources. Materials such as bamboo, logs, coconuts, and the like can all be used to improvise flotation aids.

EQUIPMENT FLOTATION

10-40. Flotation must also be placed inside all equipment—

- Webbing/TAP should be worn and water bottles emptied to enable it to float.
- Rucks should be made to float by fitting air-filled dry bags inside.
- Foam pads may also be placed inside TAPs or webbing panels to increase buoyancy.

10-41. All equipment must be thoroughly waterproofed. This is ideally achieved by using waterproof ruck liners or the waterproof wet weather bag.

Chapter 11
Logistics

Effective logistics are the lifeblood of any sustained military operation, ensuring forces have the necessary resources to accomplish their mission. This chapter details the comprehensive logistical functions required to support deployed units, from initial planning to long-term sustainment. This chapter explores resupply and cache operations, transportation management including airdrop procedures, and the critical elements of inventory control, warehousing, and maintenance. Understanding these principles is vital for maintaining operational tempo and ensuring mission success through effective resource management and support.

SECTION I – INTRODUCTION TO LOGISTICS

11-1. Logistics is the detailed organization and implementation of a complex operation. In its broadest sense, it encompasses the planning, execution, and control of the movement and maintenance of personnel, facilities, and materials to achieve strategic objectives. It is the how of accomplishing a mission, ensuring the right resources are in the right place, at the right time, and in the right quantity.

SECTION II – RESUPPLY OPERATIONS

11-2. Effective resupply operations begin with meticulous planning. This involves accurately assessing needs, forecasting requirements, and determining appropriate resupply intervals. Failing to adequately plan can lead to shortages, delays, and ultimately, mission failure.

SECTION III – CACHE OPERATIONS

11-3. Although caching will usually be associated with long-range patrols and special forces the following is a guide to this method of resupply. Caches can be used for as short a period of 2 weeks or as long as 5 years.

11-4. The purpose of cache operations is to provide a concealed and secure means of storing supplies for future use. Caches are particularly valuable in environments where resupply is unreliable or difficult, such as jungle terrain.

11-5. Types of caches include the following:

- Combat train caches are located near the main body to provide immediate resupply.
- Site caches are established at key locations along likely routes of advance.
- Route caches are placed along routes of advance to support sustained operations. In jungle environments, route caches are especially important for supporting dispersed units operating over extended distances.

11-6. Cache site selection—Considerations for concealment, accessibility, and security. In jungle environment, prioritize sites that leverage natural concealment features like dense vegetation, caves, or steep slopes. Caches will have to be carefully sited to avoid compromise. Considerations of site selection include:

- Ultimate destination of the patrol who need the cache.
- Local enemy and civilian movement.
- Access to the area by friendly forces.
- Quantity and type of stores to be cached.
- Dry and wet seasons.
- Animal life.
- Landmarks.

11-7. A suggested procedure for caching is as follows (see figure 11-1):

- Stop approximately 500 meters short of the site. This is where construction material should be collected, and store preparation carried out (if not already done so).
- Conduct reconnaissance in an area looking for obvious reference points.
- Occupy and secure the area.
- Deploy clearance patrols followed by sentries to the limit of noise (bearing in mind digging noise).
- Carry out a more detailed reconnaissance and construct the cache.
- Record the position and withdraw.

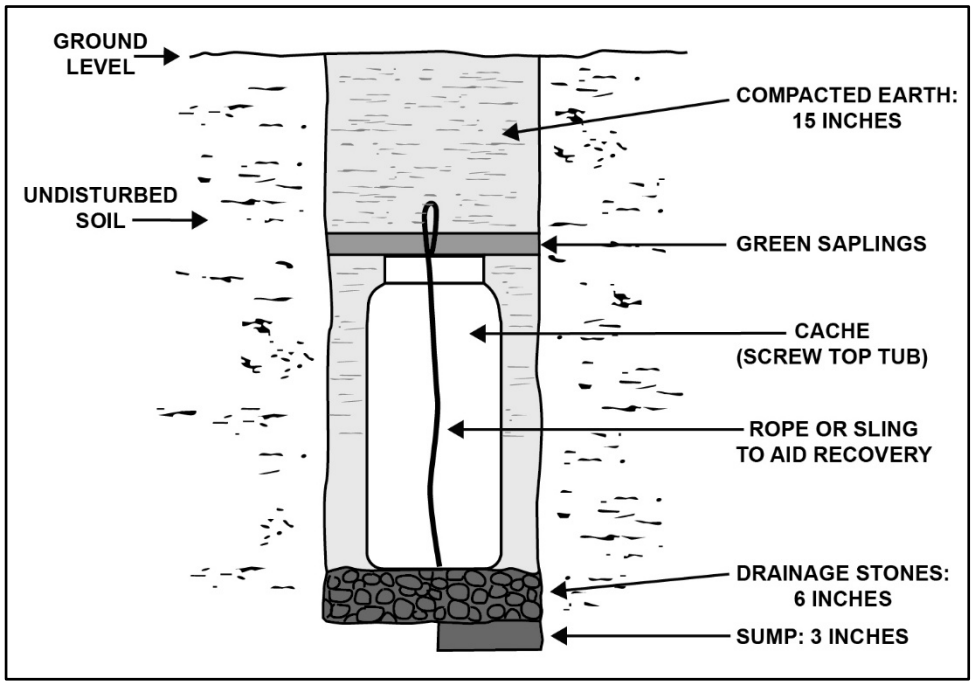


Figure 11-1. Cache, example

11-8. There are special techniques for building and concealing caches to avoid detection. Due to high humidity and rainfall in jungle environments, caches must be constructed to be waterproof and well-ventilated to prevent spoilage. Utilize local materials for camouflage, blending the cache seamlessly with the surrounding vegetation.

- Stores need to be prepared before burial. They need protection against water, humidity, and insects/other wildlife. Aids to this include plastic bags, grease, desiccants, insect repellent, and other general packaging.
- Cache contents should be clearly marked on the outside of the packaging, possibly by a color code:
  - Red—Explosives.
  - Green—Food.
  - Yellow—Medical.
  - Blue—Water.

11-9. After the container has been placed in the pit, a device to warn of enemy interference could also be used. This could be as simple as a few twigs placed in a certain manner on top of the area. Whatever device is chosen, it must be natural to the environment.

11-10. Cache security—Measures to protect caches from enemy discovery and sabotage. Jungle terrain presents unique security challenges, including increased risk of ambush and infiltration. Implement robust security measures, such as concealed OPs and booby traps (where authorized and in accordance with the Law of Land Warfare). Regular security checks are essential.

11-11. Cache recovery and management—Procedures for locating, accessing, and replenishing caches. Develop clear and redundant methods for marking and locating caches, considering the potential for map degradation or loss of GPS signal in dense jungle. Ensure personnel are trained in cache recovery procedures and understand the importance of maintaining secrecy.

SECTION IV – TRANSPORTATION MANAGEMENT

11-12. Jungle environmental considerations:

- Limitations of ground transport: dense vegetation, muddy conditions, and steep terrain severely restrict vehicle movement.
- Increased reliance on air transport: helicopters and potentially drones become crucial for moving supplies and personnel.
- Navigational challenges: dense canopy and limited visibility make accurate navigation difficult.
- Maintenance difficulties: mud, humidity, and lack of established maintenance facilities complicate vehicle maintenance.
- Riverine operations: where navigable rivers exist, they can provide a valuable transportation route, but also present security risks.

11-13. Modes of transportation—Overview of available options (ground, air, water). In jungle environments, ground transportation is often severely limited due to dense vegetation, muddy conditions, and challenging terrain. Air transport, particularly helicopters, becomes the primary method for moving supplies and personnel. Riverine

operations, where feasible, can supplement other modes, but require careful consideration of security risks.

11-14. Route planning and navigation—Identifying optimal routes, considering terrain and obstacles. Route planning in the jungle requires meticulous attention to detail. Utilize aerial reconnaissance to identify potential routes and obstacles. Navigation relies heavily on map reading, compass skills, and potentially GPS, but personnel must be prepared for signal loss under dense canopy. Establishing and marking trails is often necessary.

11-15. Vehicle maintenance and repair—Ensuring operational readiness, conducting preventative maintenance. Maintaining vehicles in the jungle is significantly more challenging. Mud, humidity, and limited access to maintenance facilities necessitate a robust preventative maintenance program. Mobile maintenance teams and pre-positioned repair parts are essential. Consider the impact of the environment on vehicle lifespan and plan accordingly.

11-16. Transportation security—Protecting assets from theft or damage. Transportation routes in the jungle are vulnerable to ambush and sabotage. Implement robust security measures, including route reconnaissance, convoy security, and counter-improvised explosive device procedures. Consider the use of camouflage and noise discipline to minimize detection (see figures 11-2 through 11-6 on pages 155 to 159).

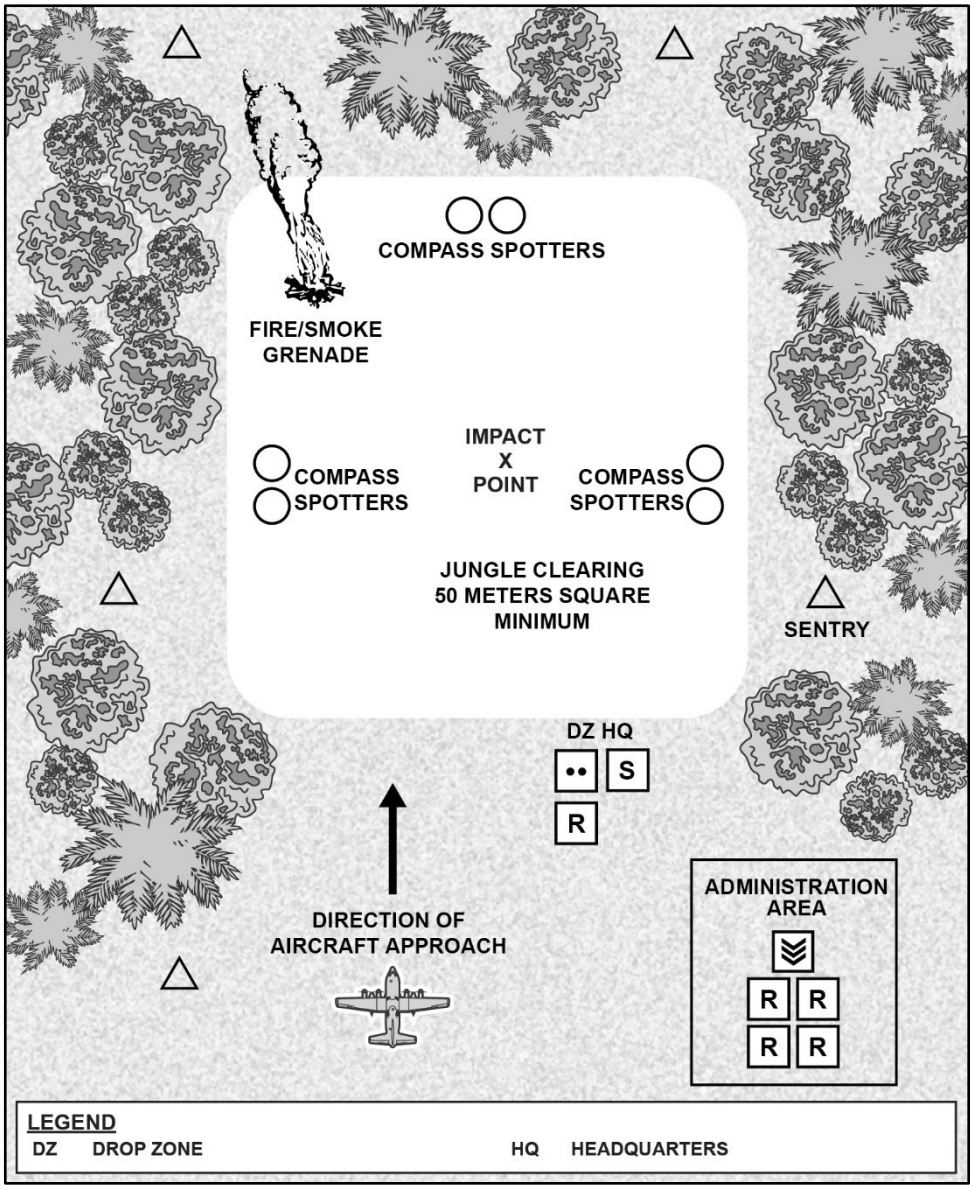
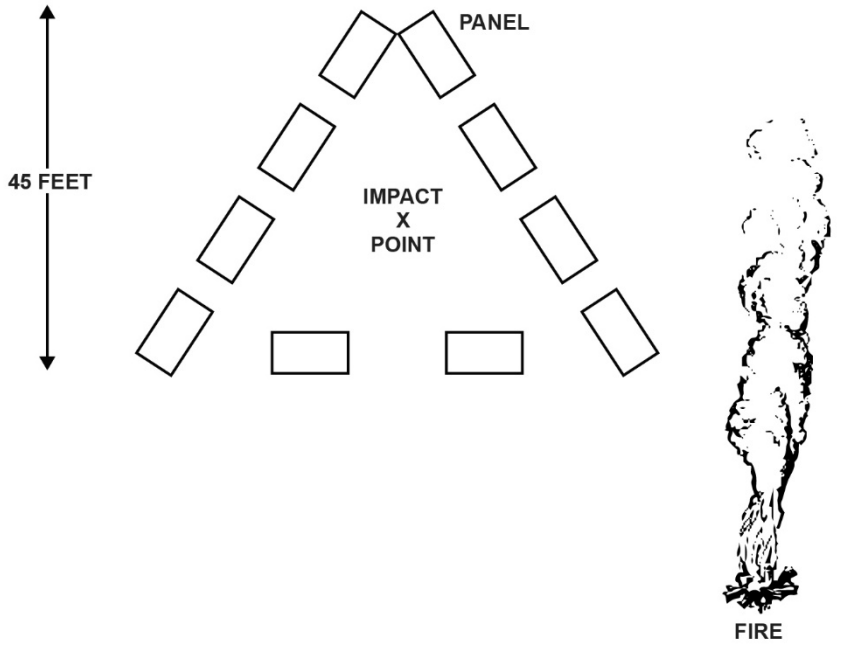


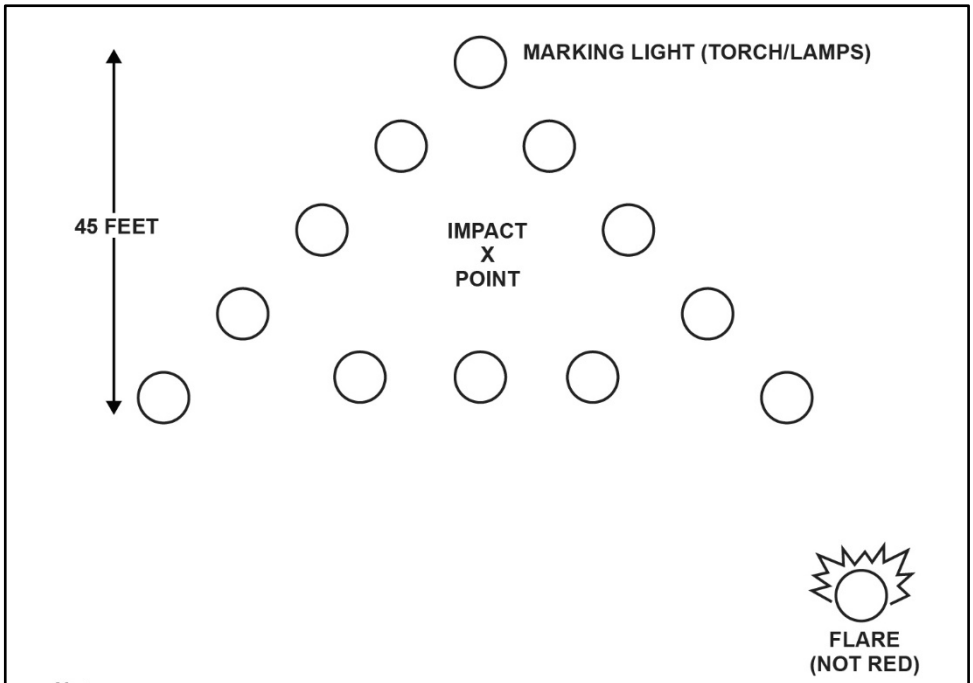
Figure 11-2. Platoon drop zone layout, example



Note:

1. The normal permissible minimum markings will consist of the Code Identifier Letter (only letters A, C, J, R or S to be used.)
2. If sufficient panels are available and the tactical situation permits, the following may be added:
   A. A limit marker panel in each corner of the drop zone (DZ).
   B. A letter 'P' placed to the left of the Code Letter at a distance of between 300 and 600 feet, however this is seldom feasible in the jungle.
3. The center of the Code Identifier Letter will denote the impact point.

Figure 11-3. Drop zone marking by day



Note:

1. The normal permissible minimum markings will consist of the Code Identifier Letter (only letters A, C, J, R or S to be used.)
2. If sufficient lights are available and the tactical situation permits, the following may be added:
   A. A limit marker panel in each corner of the drop zone (DZ).
   B. A letter 'P' placed to the left of the Code Letter at a distance of between 300 and 600 feet, however this is seldom feasible in the jungle.
3. The center of the Code Identifier Letter will denote the impact point.

Figure 11-4. Drop zone marking by night

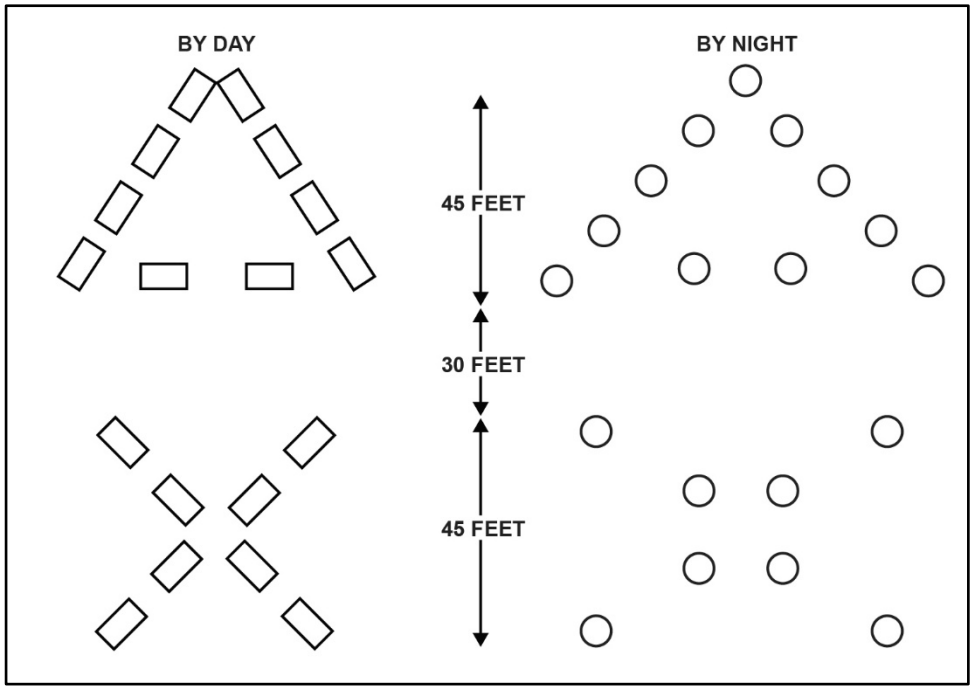


Figure 11-5. Drop zone marking, cancelled

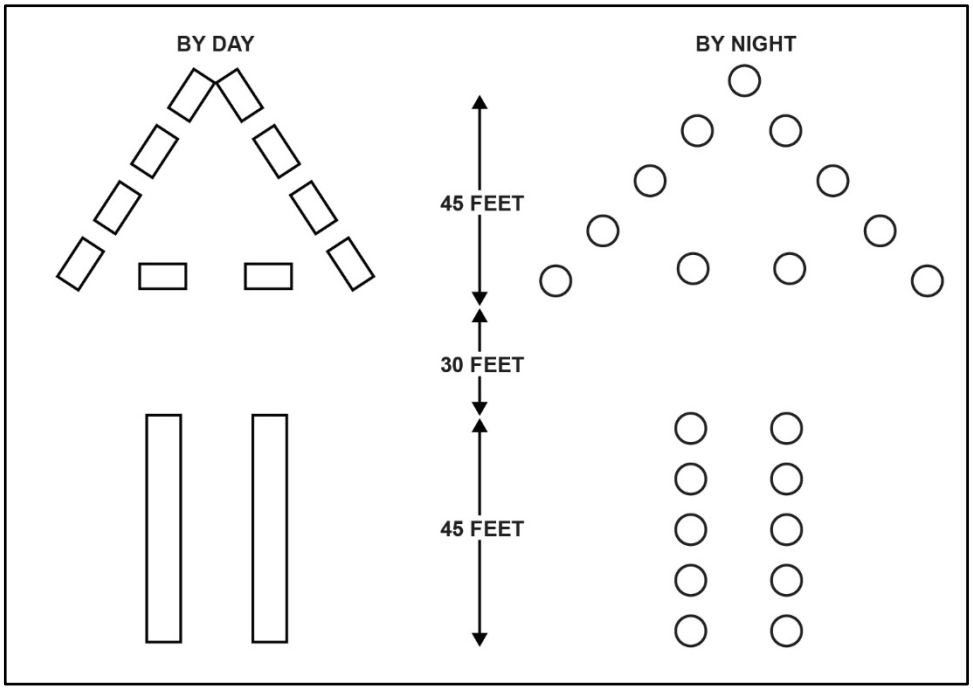


Figure 11-6. Drop zone marking, temporarily postponed

SECTION V – INVENTORY MANAGEMENT AND WAREHOUSING

11-17. Jungle considerations include the following:

- Degradation of supplies: High humidity and insect activity can quickly degrade supplies.
- Limited warehousing space: Establishing large, secure warehouses in the jungle is difficult.
- Difficult access to warehouses: Remote locations and challenging terrain hinder access.
- Increased risk of theft: Limited security and dispersed supply points increase the risk of theft.
- Importance of accurate tracking: Maintaining accurate inventory records is crucial to avoid shortages and waste.

11-18. Inventory control procedures—tracking and managing supply levels. Accurate and frequent inventory checks are crucial in the jungle environment due to the rapid degradation of supplies. Implement a robust tracking system, utilizing both manual records and digital tools where feasible. Prioritize tracking of perishable items and those susceptible to damage from humidity and insects.

11-19. Warehousing operations—receiving, storing, and issuing supplies. Establishing large, centralized warehouses in the jungle is often impractical. Instead, focus on establishing smaller, dispersed storage points close to operational units. These storage

points must be constructed to protect supplies from the elements, utilizing waterproof containers and elevated platforms. Strict control of access is essential.

11-20. Stockpile management—maintaining adequate reserves of critical items. Stockpile management requires careful consideration of shelf life and environmental factors. Rotate stock frequently to prevent spoilage. Prioritize stockpiling of items that are difficult to resupply quickly, such as medical supplies and specialized equipment.

11-21. Demand forecasting—predicting future supply needs. Demand forecasting in the jungle is challenging due to the unpredictable nature of operations. Maintain close communication with operational units to gather real-time information on supply needs. Factor in potential delays in resupply due to weather or terrain.

SECTION VI – COMMUNICATIONS AND REPORTING

11-22. Jungle considerations:

- Limited radio coverage: Dense canopy and terrain can block radio signals.
- Reliability issues: Humidity and weather can affect the performance of communication equipment.
- Security risks: Interception of communications is a concern.
- Importance of redundancy: Multiple communication methods are necessary to ensure reliable connectivity.
- Need for simplified reporting: Streamlined reporting procedures are essential for efficient information flow.

11-23. Communication systems—overview of available communication technologies. In jungle environments, reliance on line of sight communication systems (radios) is often limited by terrain and vegetation. Utilize a mix of communication methods, including satellite communications, HF radio, and potentially messenger services. Prioritize equipment that is ruggedized and resistant to humidity.

11-24. Reporting procedures—standardized formats for reporting supply status. Reporting procedures should be streamlined and focused on essential information. Utilize pre-defined templates and prioritize brevity to minimize transmission time. Implement a system for verifying receipt of reports.

11-25. Information security—protecting sensitive supply information. Communications in the jungle are vulnerable to interception. Utilize encryption and secure communication protocols. Implement strict procedures for handling sensitive information and limiting access to authorized personnel.

11-26. Coordination with higher HQ—maintaining situational awareness and requesting support. Maintain regular communication with higher HQ to provide updates on supply status and request support as needed. Be prepared to operate with limited connectivity and rely on pre-arranged contingency plans.

SECTION VII – MORTUARY AFFAIRS

11-27. Extended LOCs and restrictive terrain make evacuating deceased Soldiers difficult. Commanders develop mortuary affairs plans before initiating jungle

operations. Commanders and staff developing mortuary affairs plans for jungle environments consider that the hot and humid climate increases decomposition rates and poses a direct challenge to preservation efforts. The remains of the deceased are transported in palletized transfer cases when the tactical and logistical situation permits. Additional refrigeration equipment or facilities may be required to properly store the deceased. (For more information on mortuary affairs, see ATP 4-46.)

11-28. When the situation prohibits immediate evacuation, Soldiers may have to inter remains temporarily within the theater. Interments may only be conducted as a last resort and after being approved by the geographic combatant commander. Careful consideration must be given to selecting appropriate sites for temporary interment as changing weather and precipitation can rapidly affect burial sites.

11-29. HN support can be used to dig and fill temporary interment sites; however, HN support laborers will not handle or process the remains or personal effects of U.S. personnel. Personal effects will be interred with remains to help in the identification of remains when they are disinterred. The mortuary affairs company commander has responsibility for the layout, survey, and recording of the interment site.

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Chapter 12
Communications

Reliable and secure communications are fundamental to successful military operations, enabling command and control, situational awareness, and coordinated action. This chapter details the essential principles and practices of military communications, focusing on the equipment and TTPs required to establish and maintain connectivity in diverse environments. The chapter explores the various communication systems employed, proper antenna employment for optimal signal transmission, and the protocols governing secure and effective information exchange. Mastery of these skills is critical for ensuring seamless communication and maintaining operational effectiveness.

SECTION I – INTRODUCTION

12-1. In the jungle environment, effective communication transforms from a tactical advantage into a matter of survival. The ability to relay vital information—be it intelligence reports, calls for fire support, or simply confirming the locations of friendly units—can mean the difference between mission success and catastrophic failure.

12-2. This is where HF communication comes to the forefront. While other methods struggle against the dense foliage and unpredictable terrain, HF leverages the ionosphere to bounce signals over vast distances, bypassing the limitations of line of sight communication. This capability proves essential in the Jungle, enabling communication between units that are spread across vast distances, even in the absence of established infrastructure.

12-3. This chapter delves into the unique challenges and solutions surrounding communications in jungle operations, with a particular emphasis on the vital role of HF systems. This chapter explores the specific equipment designed to overcome these hurdles, from specialized HF radios and their power sources to the often-overlooked techniques for efficient antenna deployment in dense vegetation. Further, this chapter delves into the techniques Soldiers employ to establish and maintain clear lines of communication, including effective communication protocols tailored for jungle environments. This will ensure clear, reliable communication that forms the backbone of successful operations.

SECTION II – EQUIPMENT

12-4. Operating effectively in the jungle demands communication equipment that can withstand the rigors of the environment while providing reliable performance. Dense foliage, high humidity, and unpredictable weather conditions can cripple standard equipment, making the selection of specialized gear crucial for mission success.

12-5. Selecting the right communication equipment is only the first step. Soldiers must be well-versed in their operation, maintenance, and adaptation to the specific challenges of the jungle environment. The following sections will delve into the techniques and strategies employed to maximize the effectiveness of this equipment in the field.

HIGH-FREQUENCY RADIOS

12-6. As mentioned previously, HF radio is the cornerstone of long-range communication in the jungle. These radios utilize the ionosphere to bounce signals over vast distances, bypassing line of sight limitations imposed by dense vegetation. Man-portable HF radios, often utilizing digital modes for clarity and data transmission, are essential for squad-level communication and beyond.

VERY HIGH FREQUENCY RADIOS

12-7. While HF excels at long-range communication, VHF radios remain critical for short-range operations within the jungle. Their compact size and lighter weight make them ideal for patrols and small unit operations. Look for models designed for robustness, with features like water resistance and long battery life. Importantly, VHF frequencies can provide better penetration through dense foliage compared to higher frequency bands like ultra-high frequency, making them suitable for tactical communication within a jungle setting.

FREQUENCY MODULATION RADIOS

12-8. While VHF radios often utilize FM for transmission, it is worth highlighting the importance of FM specifically for its clarity in noisy environments. Jungle operations are rarely quiet, and the reduced static interference offered by FM can be invaluable for clear, concise communication.

MOBILE USER OBJECTIVE SYSTEM

12-9. For secure voice and data communication, especially for command elements, mobile user objective system terminals offer a reliable solution. Utilizing satellite connectivity, mobile user objective system bypasses the limitations of terrestrial infrastructure, enabling communication even in the most remote jungle locations.

SATELLITE PHONES

12-10. When all else fails, satellite phones provide a lifeline to the outside world. These devices bypass the need for terrestrial infrastructure, offering a reliable means of communication even in the most remote jungle regions. While typically reserved for emergency situations or high-level command communication due to bandwidth limitations, their importance cannot be overstated.

POWER SOURCES

12-11. Reliable power is the lifeblood of any communication system. In the jungle, this means utilizing a combination of long-lasting batteries, solar chargers, and potentially even hand-crank generators. Soldiers must be adept at power management, ensuring their equipment remains operational throughout extended missions.

ACCESSORIES

12-12. A range of accessories can enhance communication effectiveness in the jungle. Headsets with noise-canceling capabilities improve clarity in chaotic environments. Waterproof bags and cases protect sensitive equipment from the elements. Signal mirrors and whistles provide low-tech communication options for short-range signaling in emergencies.

SECTION III – TECHNIQUES AND PROCEDURES

12-13. Effective communication in the dense, unforgiving environment of the jungle can be the difference between mission success and failure. Line of sight is often limited, weather conditions can be unpredictable, and the terrain itself presents unique challenges. Adaptability and redundancy are key. This section outlines techniques and procedures to ensure clear, reliable communication in jungle operations.

UNDERSTANDING THE CHALLENGES

12-14. Dense vegetation and foliage absorb and reflects radio waves, significantly reducing range and signal strength.

12-15. Atmospheric conditions: high humidity, rain, and thunderstorms can disrupt signals and create static interference.

12-16. Terrain features: hills, ravines, and dense foliage can block line of sight communication, requiring relay stations or alternative methods.

12-17. Enemy interception: maintaining communication security is paramount. Enemy forces may be listening and attempting to jam or triangulate positions.

COMMUNICATION TECHNIQUES

12-18. Radio communication remains the primary method for transmitting voice and data across distances.

ALTERNATIVE COMMUNICATION METHODS

12-19. When radio communications are unavailable due to enemy action, equipment failure, or environmental conditions, alternative methods must be employed.

12-20. Digital messaging (when available): utilizing secure digital messaging systems via satellite or other networks.

12-21. Line of sight communication: using laser communication devices for short-range, secure data transfer. Visual signaling can also be used to include flags, pyrotechnics, mirrors, and panel markings.

SECTION IV – ANTENNAS

12-22. Antenna selection and deployment are critical for maximizing communication range and reliability in dense jungle environments. The thick foliage and uneven terrain significantly impact radio wave propagation, making the right antenna choice vital. Here is a breakdown of antenna considerations for jungle operations:

UNDERSTANDING THE CHALLENGES

12-23. Signal attenuation: dense foliage absorbs and scatters radio waves, significantly reducing signal strength, especially for higher frequencies (VHF and above).

12-24. Multipath propagation: signals can bounce off vegetation and terrain features, leading to interference, fading, and distorted transmissions.

12-25. Limited line of sight: the jungle canopy often obstructs direct paths for radio waves, requiring antennas that can operate effectively in non-line of sight conditions.

ANTENNA THEORY IN THE JUNGLE

12-26. A basic understanding of antenna theory is essential for effective communication in the jungle. Antennas work by converting electrical energy into electromagnetic waves (transmitting) and vice versa (receiving). The size and shape of an antenna determine its resonant frequency and radiation pattern. In a dense jungle:

- Wavelength matters: longer wavelengths (lower frequencies like HF) tend to diffract around obstacles better than shorter wavelengths (higher frequencies like VHF/ultra-high frequency). This is why HF often provides longer range in jungles.
- Antenna height is crucial: raising the antenna above the dense foliage, even slightly, can significantly improve signal propagation.
- Directionality can help: focusing the signal in a specific direction using directional antennas can increase signal strength at the receiving end.

ANTENNA TYPES FOR JUNGLE ENVIRONMENTS

12-27. Antenna issues are a leading cause to communication issues in the jungle. There are various techniques to improve antennas' operability.

HIGH FREQUENCY ANTENNAS

12-28. Long-wire antennas: simple and lightweight, long-wire antennas (for example, sloper, inverted-V) utilize the jungle canopy for support and can achieve surprisingly good results for HF communication over long distances.

12-29. Whip antennas: while offering limited gain, whip antennas are compact and versatile, suitable for short-range HF communication and as backups.

VERY/ULTRA HIGH FREQUENCY ANTENNAS

12-30. Directional antennas: focusing the signal in a specific direction, these antennas can overcome some limitations of jungle foliage and extend range. They require careful aiming towards the intended recipient.

12-31. Elevated dipole antennas: placing a basic dipole antenna at a higher elevation, such as suspended from a tree or mast, can significantly improve signal propagation.

12-32. Ground plane antennas: these antennas offer a good compromise between performance and portability. They require a ground plane (for example, a metal sheet or radial wires) for optimal performance.

FIELD EXPEDIENT ANTENNAS

12-33. When standard antennas are unavailable or impractical, Soldiers can construct field-expedient antennas using available materials:

- Jungle dipole: a simple dipole antenna can be constructed using wire and readily available insulators (for example, bamboo, branches).
- Elevated vertical: suspending a length of wire vertically from a tall tree can create an effective antenna for short-range communications.
- Improvised ground plane: a metallic object, like a mess kit or ammunition can, can serve as a rudimentary ground plane for a vertical antenna.

KEY CONSIDERATIONS FOR ANTENNA SELECTION AND DEPLOYMENT

12-34. Frequency range: choose antennas that match the frequency bands used by the radios (HF, VHF, ultra-high frequency).

12-35. Gain and directionality: higher gain antennas provide increased range but often come with increased size and directionality requirements.

12-36. Portability and ease of deployment: consider the weight, size, and setup time of antennas, especially for patrols and mobile operations.

12-37. Durability and weather resistance: jungle environments demand rugged antennas that can withstand high humidity, rain, and rough handling.

12-38. Camouflage and concealment: antennas should be camouflaged or concealed to avoid enemy detection and maintain operational security.

TIPS FOR OPTIMAL ANTENNA PERFORMANCE

12-39. Elevate antennas as high as possible. Even a small increase in height can significantly improve signal propagation above the dense foliage.

12-40. Orient directional antennas carefully and aim them towards the intended recipient for maximum signal strength.

12-41. Experiment with antenna placement. Signal strength can vary significantly within short distances. Experiment to find the best possible location.

12-42. Regularly inspect and clean antennas to ensure optimal performance and longevity.

12-43. Selecting and deploying the right antennas is crucial for establishing reliable communication in challenging jungle environments. By understanding the impact of jungle foliage on radio wave propagation and choosing antennas suited for the specific

operational requirements, military units can significantly enhance their communication capabilities and ensure mission success.

Chapter 13

First Aid

The ability to provide effective first aid is critical for preserving life and minimizing suffering in both combat and non-combat situations, particularly when immediate medical attention is unavailable. This chapter details the essential principles and practices of tactical first aid, with a specific focus on the unique health challenges presented by tropical environments. This chapter explores maintaining health and hygiene in challenging climates, techniques for casualty recovery and evacuation, and the core first aid procedures necessary to address a wide range of injuries and illnesses. Proficiency in these skills is paramount for self-aid, buddy-aid, and ultimately, mission success.

SECTION I – HEALTH AND HYGIENE IN TROPICS

13-1. Health and hygiene in a tropical environment are important and failure to place importance on this can result in mission failure.

PERSONAL PROTECTIVE MEASURES

13-2. Personal hygiene includes:

- Recognize that small infections quickly worsen in the jungle. Treat injuries as soon as possible given the tactical situation.
- Frequently wash hands.
- Do not rub eyes or the inside of the nose with untreated fingers or gloves.
- Bathe whenever possible; use field expedient showers.
- Do not shave, as cuts from shaving can become easily infected.
- Change socks and/or boots every 8 hours or whenever wet (use wet kit/dry kit procedures).
- Lightly apply foot powder when changing socks or boots.

13-3. Protective measures:

- Wearing long sleeves, insect repellent, and mosquito nets.
- Avoiding stagnant water and contaminated food.
- DOD insect repellant system:
  - Permethrin treated uniform.
  - Permethrin treated bed net.
  - DEET applied to skin.
  - Properly worn uniform.
  - Anti-malarial medicine.
- Consideration for selected uniform:
  - Gloves should only be worn when necessary for protection. Gloves retain heat and moisture, increasing one's hands susceptibility to infection if not periodically aired out.

- Headgear is worn to protect from sunlight. It also traps heat and moisture; take off headgear when appropriate to mitigate heat stress.
- Pants should be always tucked into boots to protect against insects and harmful vegetation. Pants may be unbloused for heat mitigation when appropriate.
- Bed nets treated with permethrin can ward off insects during sleep.

13-4. Hydration and nutrition:

- Purifying water using tablets, filters, or boiling.
- Maintaining electrolyte balance with oral rehydration salts.

13-5. Always ensure that oneself and every member of the team bring a first aid kit when operating in a jungle environment. These kits will help treat wounds and prevent infections. Even small injuries in the jungle can lead to serious problems, which can severely limit survival capabilities.

- Trauma and medical kits consist of a complete, military-issued Individual Field Aid Kit or Jungle Field Aid Kit.
- Personal aid kits. This kit should be individualized to one's needs:
  - Plasters/bandages.
  - Butterfly closure strips.
  - Hydrocortisone.
  - Anti-fungal cream.
  - Antiseptic spray/wipes.
  - Analgesic heat rub.
  - Petroleum jelly.
  - Iodine.

HOT WEATHER INJURIES

13-6. In jungle environments, heat and hot weather injuries are a constant concern. Heat-related injuries are cumulative; use the following acronym (HEAT) when considering the effects of heat on the unit.

- H–Heat category for the past 3 days.
- E–Exertion level in the past 3 days.
- A–Acclimation/Individual risk factors.
- T–Temperature/Overnight rest.

13-7. Everyone will have different risk factors. The following factors may exacerbate heat stress:

- Poor fitness.
- Large body mass.
- High levels of motivation.
- Minor illnesses (for example, allergies or the common cold inhibiting the ability to sweat).
- Medications (for example, antidepressants inhibiting the ability to sweat and increasing sensitivity to sunlight).
- Diuretics (for example, caffeine) in the bloodstream.
- Skin conditions (for example, rashes, sunburns, reactions to poisonous flora).

- Workout supplements (for example, pre-workout and/or thermogenic compounds).
- Prior hot/cold weather injuries.
- Age (over 40).

13-8. Humidity accelerates the effects that heat exerts on the body. Humidity can cause more futile sweat, depleting the body of vital electrolytes and fluids. It also prevents sweat from evaporating (as the air is already saturated with water) and reduces effectiveness of cooling measures. Heat-related deaths have occurred when temperatures were less than 75°F but relative humidity was greater than 95 percent.

COLD WEATHER INJURIES

13-9. It is still possible to suffer cold weather injuries in jungle environments. Intense changes in temperature may occur due to humidity and high elevation, increasing the bodies' susceptibility to cold weather injuries; the ambient temperature does not need to be below freezing to cause such injuries. The most common cold injuries are hypothermia and chilblains.

INJURIES AND DISEASES

13-10. Leaders within the formation must understand the risks of specific injuries and diseases to ensure the proper health on the formation.

TRENCH FOOT

13-11. Causes: Prolonged exposure of the limb or body part to damp, unsanitary, or cold conditions.

13-12. Signs and symptoms include:

- Sensations of pins and needles, where the tingling leads from numbness to pain.
- Skin discoloration (red to blue to black, where black indicates necrosis).
- Cold, swollen, and waxy appearance of the limb or body part.
- Development of blisters, open sores, or bleeding.

Note. A particular concern with this symptom is the susceptibility of the injury to fungal infections.

13-13. When untreated, the limb or body part develops gangrene and will require amputation.

13-14. Treatment:

- Prevention is the best treatment.
- Dry oneself as often as possible, keeping the feet dry and changing socks whenever possible.
- Use the dry kit/wet kit technique between rest cycles to air out the body.
- Wear lightweight shoes during rest cycles to help dry feet and wet boots.
- Use foot powder and other preventative measures as appropriate.

FAUNA-RELATED INJURIES

13-15. Insects (and other arthropods) present a major concern while operating in jungle environments. A Soldier is fighting more than just the enemy; a good rule of thumb is to assume that 50 percent of everything in the jungle is trying to kill and eat oneself. To ward off insects, it is best to use preventative measures such as proper field sanitation procedures and the DOD-approved insect repellant systems.

13-16. Common stinging or biting arthropods in Pacific AO—

- Spiders.
- Mosquitoes.
- Scorpions.
- Bees.
- Wasps.
- Ants.

13-17. Avoidance measures include the following:

- Avoid sleeping directly on the ground.
- Frequently shake out uniform, boots, and bedding.
- Avoid walking barefoot.
- Avoid putting fruity or sweet scents on oneself or equipment.
- Brush off arthropods found on the body or equipment. Some insects emit a toxic substance that may transfer onto the skin if crushed.

13-18. Symptoms of insect-related injuries (such as anaphylaxis) that may require emergency medical attention may include the following:

- Chest pains.
- Nausea.
- Severe sweating.
- Loss of breath.
- Serious swelling.
- Slurred speech.

13-19. Snakes are also a common threat in jungle environments. Although there are no snakes in Hawaii, they are common in almost every other jungle environment. Use the following considerations if faced with an injury from a snake bite:

- Lay down the casualty.
- Reassure and calm the casualty.
- Remove constricting items from the casualty, including jewelry, watches, rings, and shoes.
- Apply a pressure dressing to the afflicted area, wrapping from the heart downwards.

WARNING

Do not use a tourniquet while treating a snake bite. Using a tourniquet while treating a snake bite may lead to necrosis, venom bolus, and embolism.

- Immobilize the injured part of the casualty's body.
- Immediately transport the casualty to a medical facility.

13-20. Bats are another common jungle animal and a vector for rabies, a deadly disease—

- Signs and symptoms of rabies include agitation, confusion, hallucinations, headaches, hypersalivation, hydrophobia, and paralysis (in rare cases).
- Any mammal can contract and carry rabies.
- The rabies virus enters another host through the saliva of the infected animal. It then travels from the spinal cord of the host into the peripheral nerves, eventually making its way into the brain stem. It then spreads throughout the entire nervous system. Rabies completes the viral cycle by infecting the salivary glands of the host animal.
- Once the rabies virus travels to the brain, it is almost always fatal.
- Rabies may be prevented through prophylactic vaccination.
- Post-exposure, the Rabies Post-exposure Prophylaxis treatment (a four-dose series of vaccines) by medical providers may prevent fatal progression of the virus.

13-21. Leeches are common in the jungle, particularly in and around waterways—

- Leeches excrete saliva that will dilate blood vessels, thin blood, and deaden the pain of their bite.
- As always, prevention is better than the cure; use DEET when appropriate.
- Pouring salt or burning off attached leeches are not recommended removal methods. If leeches have latched onto the body, seek treatment from trained medical personnel.
- Always wear boots that are serviceable and fit well; keep pants tucked into boots; and regularly check teammates and oneself for leeches.
- Recommended leech removal procedures: Find the head (generally near the thinner end), slide a flat object under the head to break suction, repeat the second step for its posterior end.

FLORA-RELATED INJURIES

13-22. Injury mechanisms include the following:

- Thorns may puncture skin.
- Leaves, stems, and sap may cause rashes on contact.
- Consuming unidentified or toxic plants may cause illnesses.

13-23. Indicators of poisonous flora. These are general indicators that will help one avoid poisonous plants. Not all plants that display these indicators are poisonous. It is best to rely on trustworthy local experts to identify edible and toxic flora in the AO—

- Spiny fruit.
- Milky sap.
- Hairy leaves.
- Atypical fruit shapes.
- Oily parts.
- Shiny leaves.
- Avoided (for example, unconsumed) by local animals.

TROPICAL INFECTIOUS DISEASES

13-24. Malaria is a disease caused by a parasite that infects a certain type of mosquito—

- Symptoms: fever and flu-like illness; chills; headaches, muscle aches, and tiredness; possible nausea, vomiting, and/or diarrhea.
- Severe symptoms: kidney failure, seizures, mental confusion, and coma.
- Prevention: prior to traveling to an area with high malaria risk, speak with a healthcare provider to obtain preventative medication; use DOD-approved insect repellant systems; avoid areas with high mosquito activity; and when resting, use mosquito nets.
- Treatment: use of prescription drugs.

13-25. Dengue fever is a viral disease caused by any of the four related dengue viruses—

- Symptoms: aches and pains (eye pain typically behind the eyes and muscle, joint, or bone pain); nausea and/or vomiting; rashes.
- Prevention: any method to avoid mosquito bites as previously discussed.
- Treatment: there is no specific medicine that treats dengue fever. The afflicted person should rest as much as possible, take acetaminophen if appropriate to control fever and relieve pain, stay hydrated, and seek further attention from medical personnel.

13-26. Leptospirosis is a disease caused by the bacterium Leptospira present in contaminated water or soil. It is common in Hawaii. This disease typically spreads through the urine of infected animals—

- Symptoms: fever, headache, chills, bone or muscle aches, vomiting or nausea, jaundice (yellow skin or eyes), red eyes, stomach pain, diarrhea, and rash.

Note. People suffering from leptospirosis may display any or none of these symptoms. Symptoms generally manifest between 2 to 30 days after coming in contact with Leptospira bacterium and may last up to several weeks or even months without treatment. Some people experience two phases of the illness, where the second phase is more severe (causing possible organ failure) and occurs after appearing to recover from the relatively mild first phase.

- Prevention: practice proper field sanitation and hygiene techniques; avoid swimming in water that may be contaminated with animal urine; cover exposed cuts, scratches, or wounds with waterproof bandages.

- Treatment: Leptospirosis is treated with antibiotics; trained medical personnel should administer antibiotics as soon as possible if a casualty is suspected of suffering from leptospirosis.

13-27. Field expedient differential diagnosis between types of illnesses—

- Assume any fever is malaria until proven otherwise, especially if it is cyclical (peaking every 8, 12, 24, 48, 72 hours).
- Bloodshot eyes with fever are indicative of hemorrhagic fevers (Ebola, Crimean-Congo fever, four types of dengue).

WARNING

If a hemorrhagic fever is suspected, immediately don personal protective equipment and quarantine the casualty.

- Suspect dengue fever if the casualty presents with retro-orbital (behind the bloodshot eyes) pain.
- Suspect chikungunya virus if the casualty presents with joint pain and fever without bloodshot eyes.

SECTION II – CASUALTY RECOVERY

13-28. There are many challenges that are involved in a jungle CASEVAC—

- Dense vegetation: thick undergrowth and towering trees make it difficult to move casualties and create clear paths for evacuation.
- Limited visibility: the jungle canopy often blocks sunlight, reducing visibility and complicating navigation.
- Terrain: steep slopes, muddy ground, and water obstacles (for example, rivers, swamps) hinder movement.
- Weather: frequent rain and high humidity can degrade equipment and increase the risk of injuries or infections.
- Hostile environment: the presence of enemy forces, dangerous wildlife, and poisonous plants adds to the complexity of evacuation.
- Communication: Radio signals may be obstructed by the dense canopy, making coordination with extraction teams more difficult.

13-29. When a casualty occurs in a jungle environment, the first step is to assess the situation by determining the nature and severity of the injury while identifying any immediate threats, such as enemy presence, wildlife, or environmental hazards. Once the situation is understood, the priority is to stabilize the casualty by performing life-saving measures, including controlling bleeding, managing the airway, and treating for shock. It is equally important to protect the casualty from further harm by moving them away from danger and shielding them from environmental factors like rain. Communication is critical during this phase; use radios, signal mirrors, or flares to contact the command post or extraction team. When communicating, provide a clear and concise report using the MIST format: describe the Mechanism of injury, the Injuries

sustained, the Signs and symptoms observed, and the Treatment provided. This structured approach ensures that the casualty receives timely and effective care while enabling the extraction team to prepare appropriately.

REQUESTING MEDICAL EVACUATION

13-30. Considerations for requesting medical evacuation include the following:

- The decision to request a medical evacuation and the level of evacuation precedence will be made by the senior medical personnel on the scene, or if medical personnel are unavailable, the senior ranking military officer based on the patient's condition and the tactical situation.
- The same 9-line format is used for both air and ground medical evacuation requests. (Utilize GTA 08-01-004.)
- The request should be transmitted using secure communications for operational security. Use brevity codes whenever possible.

13-31. Difficulties include the following:

- The range of FM radio communications in the jungle may be significantly reduced due to the dense undergrowth, heavy rains, and hilly terrain. The radio transmission range can be extended by using additional radio relays and field expedient antennas.
- There may be few suitable LZs. Many LZs will only be large enough to support one or two helicopters at a time.
- LZs may have to be created by clearing brush, which takes time and manpower.
- Hoist operations may be required more frequently in the thick jungle vegetation where LZs are not available.

13-32. Jungle LZ requirements include the following:

- Minimum size of 30-meter x 30 meter (100 feet x 100 feet).
- Clear canopy and surface.
- LZ marking.
- Clear visibility.
- LZ brief.
- Marking techniques.

JUNGLE PENETRATOR

13-33. A jungle penetrator is a specialized hoist device used for vertical extraction in areas with no LZs. The steps for use include the following:

- Clear a small area of vegetation above the casualty.
- Signal the helicopter using VS-17 panels, smoke, or radio.
- Guide the penetrator to the casualty.
- To deploy, disconnect a strap, wrap it around the body under the armpits, and reconnect the strap to the device. An alternative is to place the right arm through the loop followed by the left arm.
- Fold one or two seats down (two are much more comfortable).
- Mount the seat and tighten the strap.
- Signal when ready (radio, shake the cable vigorously, or give a thumbs up).
- Fold arms around the device, around the chest.

- Drag feet as the hoist lifts one off the ground to prevent excessive spin (see figure 13-1).

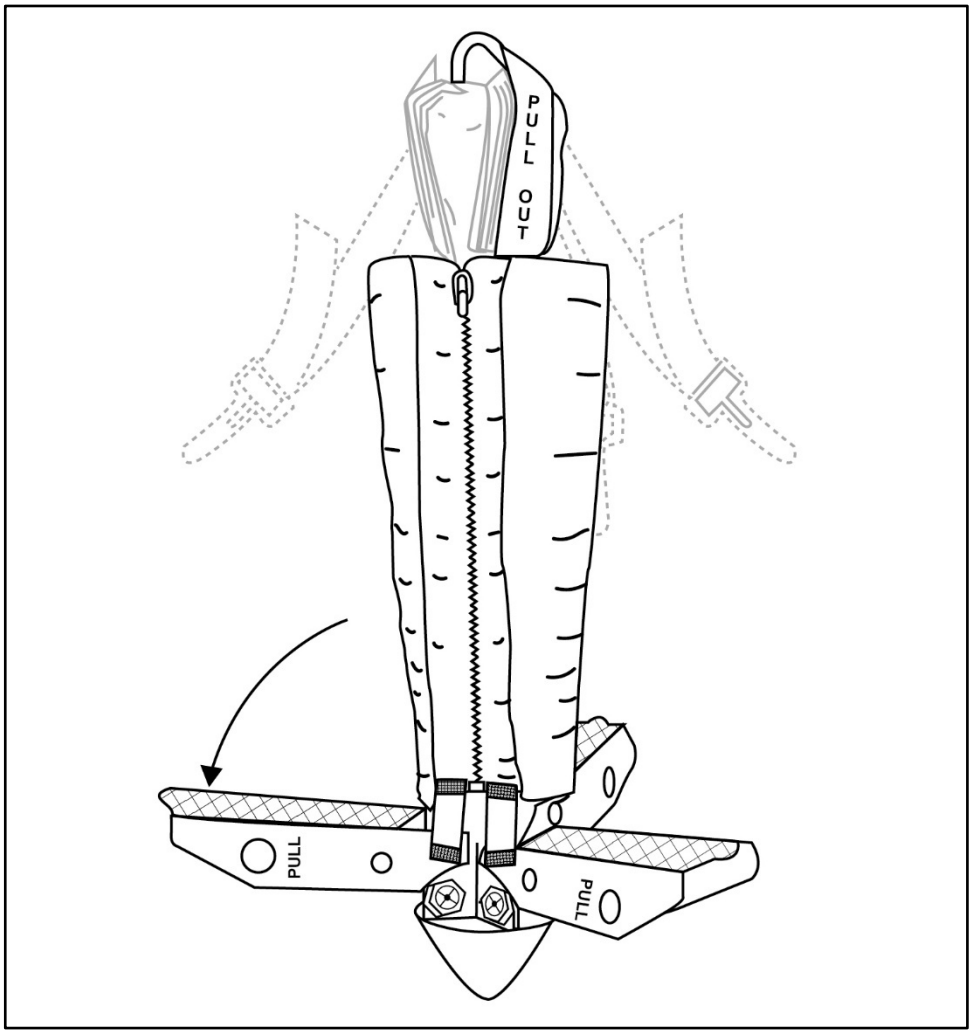


Figure 13-1. Jungle penetrator rescue seat

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Appendix A

Common Waterborne Diseases

Table A-1 lists several common waterborne diseases. Be aware that there may be more that are still yet to be found or not as common. The most common diseases include giardiasis, cholera, shigellosis, amebiasis, cryptosporidiosis, and leptospirosis. Leptospirosis is known for causing dysentery.

Table A-1. Common Waterborne Diseases

Disease	***Pathogen***	***Symptoms***	***Causes***	***Incubation***
Adenovirus Infection	*Adenoviridae* virus	Varies depending on which part of the body is infected	Drinking contaminated water	5 to 8 days
Amebiasis	*Entamoeba histolytica* parasite	Diarrhea, stomach pain, and stomach cramping	Fecal matter of an infected person (usually ingested from a pool or an infected water supply)	2 to 4 weeks
Campylobacteriosis	*Campylobacter jejuni* bacteria		Chicken, unpasteurized milk, water	2 to 10 days
Cryptosporidiosis	*Cryptosporidium* parasite	Stomach cramps, dehydration, nausea, vomiting, fever, weight loss	Fecal matter of an infected person (can survive for days in chlorinated pools)	2 to 10 days
Cholera	*Vibrio cholerae* bacteria	Watery diarrhea, vomiting, and leg cramps	Contaminated drinking water, rivers and coastal waters	2 hours to 5 days
E. Coli 0157:H7	*Escherichia coli* bacteria	Diarrhea (may be bloody), abdominal pain, nausea, vomiting, fever, Hemolytic Uremic Syndrome	Undercooked ground beef, imported cheeses, unpasteurized milk or juice, cider, alfalfa sprouts	1 to 8 days

Table A-1. Common Waterborne Diseases, continued

Disease	Pathogen	Symptoms	Causes	Incubation
Giardiasis	*Giardia lamblia* parasite	Diarrhea, excess gas, stomach or abdominal cramps, and upset stomach or nausea	Swallowing recreational water contaminated with Giardia	1 to 2 weeks
Hepatitis A	*Hepatitis A* virus	Fever, fatigue, stomach pain, nausea, dark urine, jaundice	Ready-to-eat foods, fruit and juice, milk products, shellfish, salads, vegetables, sandwiches, water	28 days
Legionellosis	*Legionella pneumophila* bacteria	Fever, chills, pneumonia, anorexia, muscle aches, diarrhea and vomiting	Contaminated water	2 to 10 days
Leptospirosis	*Genus Leptospira* bacteria	Can induce wide range of symptoms or none. If untreated, can cause kidney damage, meningitis (inflammation of the membrane around the brain and spinal cord), liver failure, respiratory distress, and even death	Contaminated water	Varies
Salmonellosis	*Salmonella* bacteria	Abdominal pain, headache, fever, nausea, diarrhea, chills, cramps	Poultry, eggs, meat, meat products, milk, smoked fish, protein foods, juice	1 to 3 days

Table A-1. Common Waterborne Diseases, continued

Disease	Pathogen	Symptoms	Causes	Incubation
Shigellosis	*Shigella bacteria*	Diarrhea, fever, and stomach cramps	Contaminated water	5 to 7 days
Vibrio Infection	*Vibrio parahaemolyticus* *Vibrio vulnificus* bacteria	Nausea, vomiting, headache (a quarter of patients experience dysentery-like symptoms)	Raw shellfish, oysters	1 to 7+ days
Viral Gastroenteritis	*Calicivirus* virus	Diarrhea, vomiting, nausea, cramps, headache, muscle aches, tiredness, slight fever	Water, ready-to-eat foods (salad, sandwiches, bread) shellfish	24 to 48 hours

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Appendix B

B-720 Tips (DEC 95), 1/7 Special Forces Group

The B-720 Tips are an update of the Vietnam era B-52 TIPS. The B-52 Tips were published in 1970 and captured valuable combat experience in jungle operations. In 1988, the 1st Battalion, 7th Special Forces Group (with several joint attachments), conducted an extensive series of jungle operations. They ended the exercises by updating the B-52 Tips to cover changes in equipment, weapons, and doctrine. These tips are historic and while many things have changed it is important to learn from the past. As one reads through, keep in mind the history of the information. These tips are for context only and should not be considered as current doctrine.

B-1. The B-720 Tips are organized into 10 major areas:

- Leader Tips.
- Uniform & Equipment Tips.
- LCE/Rucksack Tips.
- NVG Tips.
- Weapons Tips.
- Commo Tips.
- Infil/Exfil Tips.
- Recon Tips.
- RON Tips.
- Hatchet Team Tips.

B-2. Leader Tips:

- No individual or team can practice or train too much or too often.
- Teamwork is the key to success and will only come through constant training and rehearsal.
- While on a mission, minimize fatigue, because tired men become careless.
- If you show confidence, your team will have confidence.
- Always have an alternate plan. Think ahead.
- If you lose your temper, it will affect your judgment. Keep cool!
- Don’t be afraid to take advice from your team members.
- Realism must be injected into all phases of training, such as zeroing weapons at targets in the jungle, using live training aids for PW snatch or ambush practice, etc.
- Conduct at least half of your training at night.
- Teams that have a good physical training program have fewer health problems.
- Have a pre-mission and post-mission checklist to ensure that nothing is left behind.
- Correct all personal, individual, and team errors on the spot.
- Use tact when reprimanding your personnel, especially indigenous team members. If possible, take the man aside to criticize him. This enables him to

react positively to the criticism, since he will not lose face, feel ridiculed or lose self-confidence.

- Conduct English classes for your indigenous personnel, especially interpreters. Conduct classes for your U. S. personnel in your indigenous team members' language.
- Don't set patterns in your operations.
- Never do the obvious.
- On patrol, stay alert at all times. You are never 100-percent safe until you are back home.
- Have team members write down tips and lessons learned, and collect and consolidate them at the end of each mission.
- Don't arbitrarily make all "tips of the trade" your team SOP. Always consider METT-T.

B-3. Uniform and equipment common to all:

- Wear camouflage BDUs on operations. Even when soaking wet at night, BDUs are remarkably "invisible" to NVGs. Plain OG-107 jungle fatigues, however, appear completely black when wet, and wet LCE appears like white stripes on them—a man's silhouette can be clearly and easily seen by an enemy using NVGs.
- Don't use luminous tape. It's easily spotted at long distance with NVGs.
- Wear loose-fitting and untailored clothing on field operations. Tight-fitting clothing often tears or rips, allowing mosquitoes and leeches easy access to exposed parts of the body.
- Tuck your jacket into your pants. You can't use the lower pockets because of your LCE anyway, and, in contact, you can temporarily stuff expended magazines inside your shirt.
- Wear gloves to protect hands from thorns, poisonous plants, and insect bites, provide camouflage, and aid in holding a weapon when it heats up from firing. Aviator's Nomex gloves work well.
- Sew in a section of VS-17 panel to cover the inside top of your field hat, for use as an emergency daylight position marking signal to friendly aircraft. In the center of that, sew a 2" x 2" piece of USAF "burn tape" for use as a night-time position marking signal to AC-130 gunships (2" x 2" is the size recommended by the AC-130 low-light/night television operators).
- Sew the same signal pattern inside your fatigue shirt, since hats are easily lost in firefights or pursuits.
- Do not hang clothing or bandannas on green bamboo if you plan on wearing it afterwards. The fuzz on the bamboo is just like itching powder. Of course, clothing should not be removed or "hung out" on patrol.
- If your mission requires long ropes, consider the use of 1" nylon tubing instead. It is lighter, more compact, and just as strong.

B-4. LCE/Ruck Tips:

- Be sure that all snaps and buckles are taped. Do not use paper tape.
- Always carry a sharp knife or bayonet on patrol.
- Always wear your LCE buckled when not sleeping. If you're wounded, your teammates can drag you by your LCE shoulder straps.

- For survival, each individual should carry a cut-down MRE in his pants' cargo pocket, and one tube of bouillon cubes in the first aid pouch on his LCE. One bouillon cube dissolved in one canteen of water will provide energy for one or two days.
- Don't use 2-quart canteen covers to carry 30-round magazines. You can fit eight mags in one, but once you take the first mag out, the others rattle loudly and spill out easily. Use regular ammo pouches.
- Sew a long slim pocket on the side of your ruck to accommodate the long antenna, or use an accessory kit bag clipped and tied to the side of the ruck.
- Snap the snap link on your rucksack through the loop in the upper portion of your rucksack carrying straps or the frame, so you won't lose it during exfil when you snap it on a ladder or extraction fastrope.
- Insect repellent leaks and spills easily, so put it in a ziplock bag and isolate it from your other equipment in the rucksack. Also, squeeze air from the repellent container and screw the cap on firmly.
- Always use the water from canteens in or on your rucksack before using water in the canteens on your belt. This will ensure a supply of water should you ditch or lose your rucksack.
- Test the shoulder straps on the rucksack before packing it for patrol. Always carry some parachute cord to repair straps on patrol.
- Use a waterproof bag in the rucksack to protect equipment while on patrol. This is extremely important during the rainy season.
- Camouflage your rucksack with black spray paint.

B-5. Night vision goggles (NVG) tips:

- At night, carry NVGs in a claymore bag around your neck on your chest. This allows easy access and protects the NVGs from the elements.
- Always carry a spare battery for your NVGs.
- When in an OP at night, scan with NVGs only for a few moments every five minutes or so. If you scan continuously, you increase the chance of the enemy spotting your position (when two persons using NVGs in the passive mode look directly at each other, they will see glowing "cat-eyes," caused by retro-reflectivity).
- When moving at night, only every other man should wear his NVGs. Point and trail always wear NVGs.
- "Starlight" NVGs and Thermal Imaging Sights (TISs) complement each other, and are best used in combination. The point wears a PVS-5/7 NVG, and the slack (the man behind the point) uses a TIS.

B-6. Weapons tips:

- Never assume that your weapon is clean enough on an operation. CLEAN YOUR WEAPON DAILY.
- Always carry rifle-cleaning equipment on operations—bore and chamber brushes, cleaning rag and patches, cleaning rod with handle and tip, and a small vial of weapons oil. A shaving brush is very useful.
- When you fire your weapon, shoot low, particularly at night. Ricochets will kill just as well, and most people hit the ground when shooting starts.

- Use one magazine full of tracer during infiltration and exfiltration. If taken under fire during infiltration or exfiltration, the tracers can be used to identify enemy positions to friendly air support.
- The last three rounds in each magazine should be tracer to remind the firer that he needs a fresh magazine. Alternative: The last eight rounds are three tracers followed by five balls.
- Quietly replace the cartridge in the chamber of your weapon each morning. Condensation may cause a malfunction.
- Oil the selector switch on your weapon daily and work the switch back and forth, especially during rainy season. This will prevent the common occurrence of a stuck switch.
- Always carry your weapon with the selector switch on "safe."
- Use a plastic muzzle cap or tape to keep water and dirt out of the barrel.
- To improve noise discipline, tape all sling swivels.
- Rig the jungle sling so it is easily adjustable (for easy transition from rappel/fastrope to carry/fire). Tape a spare field dressing to the sling at the stock, using a single strip of wide cloth tape with a quick- release tab.
- Check all magazines before going on an operation to ensure they are clean, properly loaded and that the springs are oiled and functioning. Magazine problems cause the majority of weapons malfunctions.
- Place magazines upside down in your pouches to keep out dirt and water.
- Do not retrieve your first expended magazine during contact because it will consume valuable time.

B-7. Saw Gunner Tips:

- Silence ammo in plastic drums by making inserts from tablet-back cardboard covered with acetate. Cut to fit two per drum.
- When moving, use a 30-round magazine in the SAW. Attach a drum in the ORP or once in position in a hasty ambush.
- SAW drum pouches are tightly-fitted and tend to pop open when you drop into the prone. Use cloth tape with quick-release tabs to prevent this. The 2-quart canteen covers are acceptable substitutes.

B-8. Claymore Tips:

- Claymores are factory-packed "backwards;" i.e., to be emplaced from the firing position to the mine position, with the excess wire left at the mine. This is corrected by removing all the firing wire from the plastic spool, discarding the spool, re-rolling the wire "S"- or "Figure-8"- fashion, and replacing it in the bag so as to enable the mine to be emplaced first and the wire laid back to the firing position. The clacker with circuit tester attached is preconnected to the firing wire and stowed in the mine pouch. The unit commander must make the decision to either prime the mine before departing on the mission, or to only put the shipping plugs on the electric and nonelectric blasting caps to speed priming during emplacement.
- Dual-prime each claymore for both electric and nonelectric firing. The time fuses should be pre-cut for 30-, 60-, or 120-second delay, for pursuit/break-contact situations. However, the burn time on the fuse becomes undependable the longer the fuse is exposed to wet/humid conditions.

- Waterproof your nonelectric firing systems.
- Carry the claymore in the rucksack so it's immediately accessible, so after breaking contact it can be quickly armed and emplaced on the back trail (even while it's still in the ruck) to delay pursuers.
- When placing claymores around your position (OP, ambush, RON, etc.), they should be emplaced one at a time by two men - one man emplacing the mine, and the other standing guard.
- Never emplace a claymore in a position that prevents you from having visual contact with it.
- Because you only emplace a claymore where you can observe it, if you are operating in dense jungle, you may consider cutting your firing wire in half since you won't use more than 50 feet/5 meters of wire, easing emplacement and recovery and cutting weight.
- Emplace each claymore so the blast parallels the team, and the firing wire does not lead straight back to the team position from the mine. If the claymores are turned around by the enemy, they will not point at the team.
- Determine in advance who will fire each claymore and who will give the command or signal to fire.

B-9. Grenade Tips:

- Make continuous daily checks on all grenades when on patrol to ensure that the primers are not coming unscrewed.
- Do not bend the pins on the grenades flat. The rings are too hard to pull when needed.
- Fold paper tape through the rings of grenades and tape the ring to the body of the grenade. The paper tape will tear for fast use, while plastic or cloth tape will not. It also keeps the ring open for your finger, stops noise and prevents snagging.
- All team members should carry a mixture of fragmentation, CS and WP grenades on their belts for the following reasons:
  - Fragmentation grenades are good for inflicting casualties.
  - CS grenades are ideal for stopping or slowing down enemy troops and dogs pursuing your team, and are effective in damp and wet weather, whereas CS powder will dissipate.
  - WP grenades have a great psychological effect against enemy troops and can be used for the same purpose as CS grenades. The use of CS and WP at the same time will more than double their effectiveness.
- Thoroughly train and test your indigenous troops in grenade-throwing, particularly WP. Not all of them might be adept at baseball-style throwing, or be able to get much distance.
- Violet and red are the smoke colors most visible from the air. However, in dense jungle or wet weather, use WP to signal aircraft.
- Notify aircraft before signaling with WP. Gunships or fighter-bombers may mistake it for a marking rocket indicating an enemy position and attack you.
- Camouflage smoke, CS, and WP grenades, using black or OD spray paint.
- Smoke grenades should be carried in or on the pack and not on the LCE. You don't fight with smoke grenades, and if you need one, 99 times out of 100, you will have time to get it from your pack.

- Each team should carry one thermite grenade for destruction of either friendly or enemy equipment.

B-10. Communication Tips:

- Communication is everyone's responsibility, not just the communication sergeant's.
- Always inventory and inspect your radios, kitbags, secures and sensors before and after all missions.
- Place a plastic cover over your PRC-77/KY-57, and wrap them in an additional waterproof bag.
- Pre-set frequencies on the PRC-77 so that a quick turn of the dials will put you on the desired frequency. This is especially helpful at night when you want to avoid a light.
- Carefully inspect your X-mode cable for bent pins and dirt in the female connectors.
- Take along secure hand-held radios with earphones and whisper mikes for internal in-position team communications during ambush and PW snatch missions.
- Perform pre-mission radio checks:
  - with your radio and secure packed in your ruck exactly the way you will carry them in the field;
  - after your crypto has been loaded;
  - with and without the secure hooked up;
  - with your FOB, helicopters, fire support, the hatchet team, other teams operating adjacent to your AO, and your internal radios;
  - bending the X-mode cable while receiving/transmitting to check for excessive static and/or loss of communication.
- Before a mission, always place fresh batteries into your communication gear and sensors, especially the BA-1372 memory battery for the KY-57.
- Always carry spare PRC-77 and KY-57 batteries, but do not remove the spares from their plastic wrapping prior to use, or they may lose power.
- Carry the lithium BA-5598 batteries for the PRC-77. This cuts weight, and since the spare is in the battery cover, it speeds emergency replacement.
- Ensure the PRC-77 battery cover vent is operational, because of the gases produced by the lithium batteries.
- Ensure the cover vent is on the same side as the battery connector.
- Don't try to weatherproof your handmike with a plastic wrapper. Water condenses on the inside anyway, it rustles loudly, and at night, it shines like a signal light when viewed through NVGs.
- Always carry a spare handmike in a waterproof bag.
- Don't carry your spare handmike where it might get crushed when you drop your ruck.
- Clean all contacts daily with the eraser end of a standard No. 2 pencil.
- Waterproof your CEOI and authentication tables by laminating them with acetate or putting them in a plastic zip-lock bag.
- Constantly check to make sure your CEOI authentication tables are folded open to the page showing the most current set. This will prevent dangerous delays when your AC-130 requests authentication, especially at night.

- Carry a single strand of claymore firing wire or WD-1 cut to your operating frequency for use as a field-expedient antenna. Secure one end (stripped of insulation) to the radio with an antenna base, then string the wire straight up to a branch (omni-directional), or lay it on the ground in the direction of the receiving station (directional).
- Minimize radio traffic.
- Do not send "same" or "no change" when reporting team location. Always send your coordinates.
- Say back grid coordinates sent to you to ensure accurate copy.
- The FOB must avoid making unnecessary, unscheduled "radio checks" just because they haven't heard from a team for a while. Be patient.
- Whisper into the handmike while in the field. Exhale first, then speak, or your transmission will sound like a tire leaking air. Cup your hand over the handmike mouthpiece and your mouth to mask your voice.
- Always remain calm and professional, no matter what happens. Screaming or speaking in emotional, angry, or desperate tones will cause the FOB to doubt your judgment and the accuracy of whatever you're saying.

B-11. Infiltration/exfiltration tips:

- When loading the aircraft for infiltration, ensure the team is seated so that they can exit the proper door.
- Load the team in reverse order.
- Sudden shifts of weight in flight will cause temporary loss of aircraft control. Don't cause any.
- The team leader and pilot will determine direction of approach to the infiltration LZ.
- The team leader will wear a headset to talk with the pilot until just before touchdown/insertion.
- The team leader will follow the flight with his 1:50,000 map from the FOB to his infiltration LZ. The team leader, not the pilot, is the man ultimately responsible for where the team is inserted.
- When unloading a UH-1 at the hover, team members will unload one at a time to enable the pilot to stabilize his aircraft.
- If the aircraft has to hover more than 6-8 feet off the ground, use a fastrope/ladder to avoid injury to team members.
- If the first man exits the aircraft under fire, the entire team will exit the aircraft.
- If the aircraft crashes, the team leader is in command on the ground. He will do the following:
  - Secure an area 50 meters in front of the aircraft.
  - Account for his team and aircrew.
  - Call for a rescue aircraft.
  - Treat casualties.
  - With the pilot return to the aircraft to zero the radios and secures, turn off the gas, destroy the battery, and remove maps, CEOIs, pilot's notebooks, weapons (door guns) and ammunition.
  - Evacuate aircrew and casualties (including KIA) on the first aircraft.
  - Evacuate remainder of team on the last aircraft.

  - Inform your personnel in what order they will be extracted prior to the arrival of the extraction aircraft. The LZ should be secured prior to the arrival of the aircraft.
  - Give the pilot an LZ description and approach heading.
  - Notify aircraft before firing pen-flares, because they look like tracers.
- Never turn your back without covering fire. If none is available, return fire while backing off.
- The assistant team leader is the first to enter the exfiltration aircraft and counts the team aboard. The team leader or senior remaining detachment member is the last to enter aircraft, and the only man who can give the pilot the O.K. to lift off. Make sure you have everyone.
- During extraction, do not fire weapons from helicopters after leaving the LZ, because a helicopter may be passing under you without your knowledge.
- In selection of LZs, avoid likely or large LZs.

B-12. Reconnaissance patrol tips:

- When making an aerial visual reconnaissance (VRs), always mark every LZ within and adjacent to your AO on your map. Plan the route of march so that you will always know the distance and azimuth to the nearest LZ.
- Always plan a primary exfiltration LZ and two or more alternates.
- Your alternate LZs should be in the direction of your E. & E. corridor.
- Don't cut off too much of the map showing your AO. Always keep at least 5-10 km surrounding your AO as "running room."
- Base the number of canteens per man on the weather and availability of water in the AO. Select water points when planning your route of march.
- Inspect each team member's uniform and equipment, especially radios, sensors, NVGs, cameras and strobe lights, prior to departure on a mission.
- Check all team members prior to departing homebase for passes, ID cards, notebooks with writing in them, cigarettes, lighters and rings with insignia, etc. Personnel should only carry dog tags while on patrol.
- Always carry maps and notebooks in waterproof containers.
- Use a pencil to make notes during an operation. Ink smears when it becomes wet; lead does not.
- Use "Storm-Safe" or "Wet-Notes" waterproof notebooks (commercially available) so you can take notes, make sketches, etc., while it's raining.
- During the rainy season, take extra cough medicine and codeine on patrol.
- During the dry season, do not urinate on rocks or leaves, because the wet spot may be seen, and the odor will carry. Use a hole or small crevice.
- The location and proper use of morphine should be known by all team members.
- Each team member should carry maps, notebooks, and CEOIs in the same pockets of each uniform, for hasty removal by other team members if someone becomes a casualty.
- All survival equipment should be tied or secured to the uniform or harness to prevent loss if pockets become torn, etc.

- Do not take Zippo-style cigarette lighters to the field, as they make too much noise when opening and closing. Of course: you never smoke on patrol, because the odor travels long distances in the jungle.
- Have designated primary and alternate rally points and LZs at all times. The team leader is responsible for ensuring that each team member knows the azimuth and distance to each rally point/LZ.
- Never take pictures of team members while on patrol. If the enemy captures the camera, he will have gained valuable intelligence.
- At least two pen lights with infrared filters should be carried by the team.
- While on patrol, move 20 minutes and halt and listen for 10 minutes. Listen half the amount of time you move. Move and halt at irregular intervals.
- Deviate from your route of march often. Never move in a straight line.
- Never move along bottoms, ridgelines, or other easy and obvious routes. Always use the military crest of hills for your movement.
- Stay alert at all times. You are never 100-percent safe until you are back home.
- Avoid overconfidence, it leads to carelessness. Just because you haven't seen any sign of the enemy for 3 or 4 days doesn't mean that he isn't there or hasn't seen you.
- A large percentage of patrols have been compromised due to poor noise discipline. Speak and talk quietly.
- Never break limbs or branches on trees or bushes, or you will leave a clear trail for the enemy to follow.
- Put insect/leech repellent around tops of boots, on pants fly, belt, and cuffs to stop leeches and insects.
- Do most of your moving during the morning hours to conserve water. However, never be afraid to move at night, especially if you think your RON has been compromised.
- Continually check to ensure your point man is on the correct azimuth. Change direction often.
- If followed by trackers, change direction of movement often and attempt to evade or ambush them. They make good PWs.
- Force yourself to cough whenever a high performance aircraft passes over. It will clear your throat, ease tension, and cannot be heard. If you must cough, cough into your hat or neckerchief to smother the noise.
- Never take your web gear off, day or night. In an area where it is necessary to put on jungle sweaters/Gore-Tex jackets at night, no more than two patrol members should do so at a time. Take the sweaters/jackets off the next morning to prevent colds and overheating.
- If you change socks, especially in the rainy season, try to wait until RON and have no more than two patrol members change socks at one time. Never take off both boots at the same time.
- When a team member starts to come down with immersion foot, stop in a secure position, remove the injured person's boots, dry off his feet, put foot powder on them and place a poncho over them so they can dry out. Continued walking will only aggravate the injury, ensuring that the man will become a casualty, and halting any further progress of the team.

- Desenex Ointment or Vaseline rubbed on the feet during the rainy season or in wet conditions will aid in the prevention of immersion foot. Put on the hands, it will also help avoid chapping.
- All personnel should camouflage faces and backs of hands in the morning, at noon and in RON or ORP positions.
- Never cook or build heating fires on patrol.
- No more than 25-percent of personnel should eat chow at any one time. The rest of the team should be on security.
- Whenever the team makes an extended halt, always check 50 meters out from the perimeter.
- All team members should take notes while on an operation and compare them nightly.
- Each man on a team must continually observe the men in front of and behind him (as well as the other team members) for hand and arm signals.
- A reconnaissance team with a mine emplacement mission should never place more than one mine (AP or AT) in one small section of the road or trail at a time. If more than one is set out, the team is just resupplying the enemy, because when a mine goes off, a search will be made of the immediate area for others, and they will surely be found.
- If your mission calls for emplacing a mine in a road, take an extra fuse along, in case one is lost.
- When crossing streams observe first for activity, then send security across to check the far side. Then cross the rest of the patrol one at a time, with each man taking water as he crosses. If necessary, have all personnel cross prior to getting water.
- Treat all trails (old and new), streams, hilltops, ridgelines, and open areas as danger areas.
- Carry one extra pair of socks, plus foot powder, while on patrol, especially during the rainy season. Each team member should also carry an oversized pair of thick socks to pull over his boots when walking or crossing a trail or stream to disguise his tracks.
- During rest halts, don’t take off your pack or leave your weapon. During long breaks, such as for noon chow, don’t take off your pack until your perimeter has been checked at least 50 meters out for 360 degrees.
- During breaks, throw nothing on the ground. Stow trash in your ruck immediately. Don’t bury trash, because trackers or animals will dig it up.
- If you hear people speaking, move close enough to hear what they are saying, and take notes.
- A dead enemy’s shirt and the contents of his pockets and pack are normally more valuable than his weapon.
- If the enemy is pursuing you, deploy delay grenades and/or delay claymores of 60-120 seconds. In addition, throw CS grenades to your rear and flanks. Give the enemy a reason or excuse to quit.
- If you’re being pursued at night, HC (white smoke) and CS grenades in combination will help you break contact, blind NVGs, and screen your escape.

B-13. RON (Remain Over Night) Tips:

- Practice proper RON procedures when your team is training, even if you are on a rifle range. Take advantage of all training opportunities.
- Select a tentative RON site from your map at least two hours in advance.
- After passing a suitable RON site, "fish-hook" back and move into your selected position so that you can observe your own trail.
- Don't form the common habit of constantly turning to the same direction (always to the left, or always to the right) when fish-hooking.
- When in position, personnel should keep their equipment on and remain alert until the perimeter has been checked for 360 degrees at a distance of no less than 50 meters.
- Packs should not be taken off until it is dark.
- When deploying the team for RON, place the point man in a position opposite the most likely avenue of approach, to lead the team out in case of emergency.
- Use aiming stakes to help orient weapons toward avenues of approach.
- Azimuths (OT lines) and distances to preplanned targets should be recorded prior to nightfall. Nearby large trees or pre-positioned stakes can aid as hasty reference points for calling in artillery at night.
- Prior to dark, the team leader should tell each man the primary and alternate rally points.
- One half of the team should have their compasses set for the primary rally point and the other half for the alternate. If the enemy comes from the direction of the primary rally point, any man with the azimuth of the alternate rally point set on his compass can lead the team out.
- A buddy system should be established in case casualties are taken at night. Each man will take care of his buddy and his buddy's equipment if the buddy is wounded, injured, or killed.
- The pack or rucksack can be used as a pillow. However, ensure that the carrying straps are in the "up" position for easy insertion of the arms in case of rapid withdrawal.
- It is permissible to unhook your LCE in the RON, but it should never be taken completely off at any time during the entire stay in the field.
- A poncho, jungle sweater and rain jacket are sufficient for sleeping.
- If a person coughs in his sleep, give him as much cough syrup as he can tolerate without going punchy.
- Team members should not "bunch up" or sleep next to each other. One grenade or burst of fire could get them all. In small reconnaissance patrols, all team members should be able to touch each other without moving from position. When this is not possible due to the terrain, breakable cord can be tied from patrol member to patrol member for alerting each other at night.
- Know what your next day's plans are before settling down for the night.
- At dark, each team member should take out two or three grenades and place them near at hand for use if hit at night. Set them so they won't roll away if they're accidentally bumped.
- Wait until last light to emplace your claymores around your RON site so you won't lose them if you're run out of your RON before dark.

- When the enemy discovers your RON at night, use frags first, then claymores (explosions are disorienting and don't necessarily give your position away), then M16/M203 (the muzzle flashes will pinpoint your location), and lastly SAW/M60 (automatic weapons always draw maximum return fire).
- In some instances, it is better not to put claymores around RON positions but to rely on the use of CS grenades instead, for the following reasons:
  - When claymores have been put out and the enemy is discovered to be moving in on the team, the team might stay in place too long, waiting for the enemy to enter the killing zone.
  - If the team discovers the enemy moving in on them, the enemy will normally be "on line," not knowing the exact position of the team. If no claymores are out, predesignated team members will throw CS grenades in the direction of the enemy force. After the gas begins to disperse, the team can withdraw. When the enemy is hit with the CS, he will normally panic. If he has gas masks with him and puts them on, he will not see clearly. If he does not have them, he will run away and may even fire his weapons indiscriminately, causing overall confusion and panic. In either case, the team has a good chance to escape, unharmed and unseen.
  - If a claymore is triggered, a grenade thrown or a rifle fired, the enemy might be able to orient on the team, flank it, and box it in.
  - If claymores are used around an RON site, consider taping plastic packets of CS to the front of the mines.
- Do not send radio transmissions from your RON site unless they are absolutely necessary. Be prepared to move if you do transmit.
- Never smoke or chew tobacco or eat chow in your RON position. The odor of the food or tobacco will give your position away.
- All team members should be awake, alert, and ready to move prior to first light.
- Another 360-degree check of the perimeter at a distance of at least 50 meters should be made prior to recovering claymores and sensors and moving out.
- A thorough check should be made of the RON site just before departure to ensure that nothing is left behind and that the entire site is sterile.
- Be alert when leaving your RON. If you have been seen, you will probably be attacked or ambushed within 300 meters.
- Habits are easily formed around certain times of the day. For example, some teams always move into a RON site at 1830 or into a noon break position at exactly 1100 every day. If the enemy has been observing you, he will notice this and plan an ambush for you.

Appendix C

Tracking Terminology

This appendix defines the different terminology.

C-1. Casting: this is a drill used to locate or relocate sign. For example, where a tracker is endeavoring to locate sign at a start point/incident site or locate sign that has been abandoned or lost.

C-2. Cold track/sign: a track which is more than 24-hours old.

C-3. Combat tracking/combat TT: tracking at speed to close with the target to re-establish contact.

C-4. Conclusive: sign classified as being ‘conclusive’ is deemed decisive sign belonging to the target.

C-5. Deception: deception tactics are the attempts made by the enemy to lose/delay the tracker.

C-6. EOT: a term used to describe the four main aspects of tracking, particularly when training trackers.

C-7. Entry and exit points: these are points or passageways through which a single or number of any one quarry may pass from one environment to another.

C-8. Environment: the immediate surroundings or conditions of life or growth. The environment will frequently change, for example, moving from within the jungle, into a stream then back into the jungle, will incorporate an environment of leaves on the floor, to that of sand, then back to leaves.

C-9. Foot roll: the sole of the foot rolling through its full length from the rear of the foot.

C-10. Foul track: is defined as a track which has entered an area where numerous other tracks exist. These may be animal tracks, vehicle tracks, or the track left by another target group.

C-11. Found/located: information gained through searching, for example the information identified at an incident site.

C-12. Gait: the individual’s manner of walking. Identifying the gait of an enemy will assist a tracker in identifying a sign pattern amongst his quarries.

C-13. Hot debrief: an immediate debrief on completion of a tracking task given to pass on timely and accurate tactical information to commanders.

C-14. Hot track/sign: a track which is less than 2-hours old.

C-15. Incident: an incident/incident site is an area where the sign indicates to the tracker that the enemy has stopped and carried out some form of action. Examples include an enemy tactical pause, tactical halt or overnight halt.

C-16. Inconclusive: sign that is classified as being ‘inconclusive’ is sign that cannot be confirmed as belonging to the target.

C-17. Indicator pace: this is the pace immediately before or after a change of direction. An indicator pace is normally a shorter pace.

C-18. Key sign: this is that sign which is prominent in any one environment within a track and serves to increase the range and speed of tracking, for example, the sign that stands out the most to the tracker, for example in primary jungle-color change (overturned leaves).

C-19. Last definite sign: the last definite sign is the last point at which the tracker can identify enemy sign. While tracking the tracker should never pass his last definite sign. An exception would be when the tracker is going to probe openings. Under such circumstances the last definite sign is marked before the tracker moves beyond it.

C-20. Opening: an entrance into the undergrowth where the target may have moved through.

C-21. Pace tracking: this is ‘pace for pace’ tracking carried out during the ‘tuning-in’ period.

C-22. Patrol report: the report form used to record the information gained from a tracking patrol task.

C-23. Patrol signals report: signals message sent at the end of each day.

C-24. Pointers: these are those signs that indicate the direction of movement, for example, low foliage (grass) when tramped on or brushed forward, will remain in the direction of movement until disturbed again.

C-25. Primary impact point: the first part of the foot to strike the ground.

C-26. Probe: to investigate an area/opening when looking for further sign.

C-27. Quarry/target: persons who are being followed or pursued.

C-28. Sign pattern: this is the sign that serves to indicate the habits or the peculiarities of an individual or group. For example, the enemy patrol may have an individual who continually snaps twigs on route.

C-29. Sign/spoor: the marks inflicted by a target on the environment. For example, snapped twigs, bruised roots, and so forth. In operational tracking terminology sign is left by humans, Spoor is an Afrikaans word sometimes used when following sign. For example, ‘the TT was following the spoor…’ Sign can be defined as: ‘Any evidence of change from the natural state that is inflicted upon the environment by the passage of man, animal or machinery’.

C-30. Straight edge: this is the line found on leaves or blades of grass caused by the application of pressure, as in the folding of paper.

C-31. TP: the last part of the foot to leave the ground before it makes another step.

C-32. Time bracket: all sign in the initial stages is placed into a time bracket, for example, the time lapse between the earliest possible time that the sign could have been made and the time it was located, in the bracket, for example, the age of sign.

C-33. To follow: proceeding after the enemy without actively seeking to catch them. Trackers follow the enemy while employed on information reporting tasks.

C-34. To pursue/in pursuit: actively following the enemy to close with them to establish contact.

C-35. Track: the path of the target identified by the sign left.

C-36. Track isolation: this is where the tracker having anticipated the intended route of the target is able to 'leapfrog' ahead and through the sign pattern of his target is able to identify the same track.

C-37. Track picture: this is the overall picture (summary of findings) gained by the tracker over any given length of track.

C-38. Tracking presentation: a tracking presentation is the term used to describe a formal presentation by a tracker following a patrol on the information gained from a track. It is an instructional tool used normally during training; however, it can be used for a specific purpose during operations.

C-39. Track pursuit drill: the procedure employed while visual tracking.

C-40. Track trap: an area that is conducive to leaving and retaining good sign and spoor.

C-41. TT: this is the British Army's fundamental tracking unit.

C-42. Tuning-in: this is the initial reading of the sign that enables the tracker to think and act as the target being pursued. Each time the tracker identifies a change in environment the tracker should stop and tune-in. The tracker should think what sign is going to be left in this environment, what is likely to be the key sign, and how will the target move in this environment, for example, how will he negotiate obstacles, and so forth. Tuning-in properly will assist the tracker in anticipating the enemy's future actions.

C-43. Warm track/sign: a track which is between 2- and 24-hours old.

C-44. VT: a trained tracker.

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Glossary

ACRONYMS AND ABBREVIATIONS

°	degree
AO	area of operations
ATP	Army techniques publication
C	Celsius
CAS	close air support
CASEVAC	casualty evacuation
CCTE	close country tropical environment
CFF	call for fire
CM	cover man
DA	Department of Army
DOD	Department of Defense
EOT	element of tracking
F	Fahrenheit
FM	frequency modulation, field manual
FO	forward observer
FRIES	Fast Rope Insertion
FSCM	fire support coordination measure
GPS	Global Positioning System
GTA	graphic training aide
HF	high frequency
HN	host-nation
HQ	headquarters
IAD	immediate action drill
km	kilometer
LOC	line of communications
LP	listening post
LUP	laying up point
LZ	landing zone
MCTP	Marine Corps training publication

METT-TC (I)	mission, enemy, terrain and weather, troops and support available, time available, civil considerations, and informational considerations
mm	millimeters
MWE	men, weapons, and equipment
No.	number
NVD	night vision device
OAKOC	observation and fields of fire, avenues of approach, key terrain, obstacles, and cover and concealment [military aspects of terrain]
OP	observation post
RM	rifleman
SL	squad leader
SLLS	stop, look, listen, smell
SOC-R	Special Operations Craft Riverine
SPIES	Special Purpose Insertion
TC	training circular
TAP	tactical assault panel
TP	terminal point
TT	tracker team
TTP	tactics, techniques, and procedures
UAS	unmanned aircraft system
U.S.	United States
VHF	very high frequency
VT	visual tracker

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Index

Entries are by paragraph number.

C

classes of terrain. *9-2*

M

machine guns. *6-16*

mortars. *8-5*

N

night movement. *3-15*

S

savanna. *1-7*

V

visual tracking. *7-6*

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TC 3-21.98

18 August 2026

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